THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume IX | NOVEMBER, 1936 | No. 6

Thum Presents Detroit Course

Series of Six Lectures on Alloy Steels on Chapter's Fall Educational Program

E. E. Thum, editor of *Metal Progress*, presented the first of a series of six lectures on "Engineering Steels and Their Use" before the Detroit Chapter on Monday evening, Nov. 2.

The course is open to the public and was attended at the first meeting by 175 drenched but courageous individuals—a figure which promises to be considerably increased under better weather conditions.

The first lecture covered the selection and application of steels. In subsequent lectures the various alloy steels will be treated from the standpoint of certain properties, the second lecture covering machinability, the third strength and hardness, the fourth toughness and endurance, and the fifth heat treatability. The sixth and final lecture on Dec. 21 will be given over to a consideration of cost factors.

A second feature of the fall educational program of the Detroit Chapter was the presentation of Dr. Grossmann's lecture course on "Principles of Heat Treatment." This was conducted in Lansing, Mich., [illegible] Oct. 15 to Nov. 19 by Prof. Frederick G. Sefing, Michigan State College.

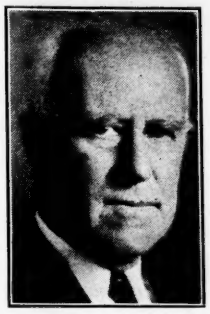
Has Record Initial Meeting

By J. L. Auer

New Jersey Chapter inaugurated its 1936-37 season with the largest attendance it has ever enjoyed at an initial meeting. Approximately 225 members and friends gathered at the Essex House in Newark to enjoy a splendid talk by the noted Mr. Leon C. Bibber of Carnegie-Illinois Steel Corp.

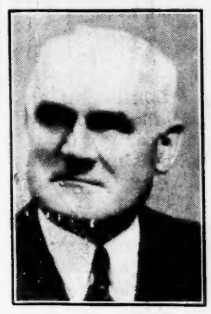
His subject was "Some Practical Aspects of Welding," presented in an interesting way which more than justified the interest of his audience and the discussion which followed.

Chapter Secretaries Receive Recognition



Alexis Caswell

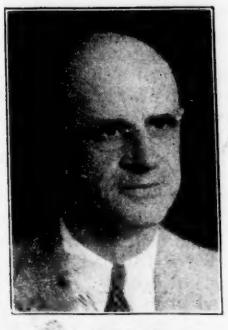
T. N. Holden



H. L. Walker

C. G. Peterson

Howard E. Handy



I. C. Matthews

Honored at the National Metal Congress in Cleveland Oct. 19 to 23, were six men who have served as secretaries of A.S.M. chapters for ten years or longer.

These men were invited by the Board of Trustees to be guests of the Society at the Convention and guests of honor at the A.S.M. Annual Banquet, in recognition of their loyal service.

Alexis Caswell, secretary, Manufacturers' Association of Minneapolis, was made chapter secretary at the organization meeting of the Northwest Chapter in 1920 and has remained so ever since.

T. N. Holden, sales representative for Despatch Oven Co., has been secretary of the New York Chapter since 1921. H. L. Walker, Pittsburgh Instrument and Machine Co., has served the Pittsburgh Chapter since 1923, and Carl G. Peterson, Providence Gas Co., has been secretary for Rhode Island since 1925. Howard E. Handy, Saco-Lowell Shops, Biddeford, Me., and Irving C. Matthews, Eastman Kodak Co., have been secretaries of the Boston and Rochester Chapters respectively since 1926.

Get Your New Handbook

The new 1936 edition of National Metals Handbook is ready for distribution to all members of the Society in good standing.

To obtain the new edition a member need only return his old copy of the 1933 edition (now obsolete) to the American Society for Metals, 7016 Euclid Ave., Cleveland, Ohio, and a copy of the new book will be sent free and postpaid promptly.

Biggest Show And Congress Are Reported

Varied Events of Metal Week Draw Record Attendance

The National Metal Congress, which closed in Cleveland on Oct. 23 after a week of widely diversified activities, goes down in A.S.M. history as the largest exposition and convention ever staged.

Attendance at the National Metal Exposition, at which 217 firms had displays covering 70,000 sq. ft. of Cleveland's Public Auditorium, was registered at 16,000. This figure represented only those who had a live interest in the metal industries, for attendance was carefully restricted.

Technical Meetings Draw Many

Attendance at technical sessions of the A.S.M. exceeded all previous records, and the two lecture courses presented during the week proved very popular, the registration at Professor Churchill's course totaling 332.

Officers' reports presented at the Annual Meeting of the Society were encouraging and optimistic. They will be printed in full in the December issue of *Transactions*.

Peoria Gets President's Bell

The President's bell and gavel was presented this year to the Peoria Chapter, signaling its progress and service to the Society.

The Annual Banquet of the Society was held Thursday evening, Oct. 22. H. V. Kaltenborn, radio commentator, was the principal speaker. His address, entitled "We Look at the World," gave an interesting account of the Spanish Civil War.

Other speakers were B. F. Fairless, president, Carnegie-Illinois Steel Co., and R. J. Wysor, executive vice-president and general manager, Republic Steel Corp. Dr. Zay Jeffries also officiated in presenting the Albert Sauveur Achievement Medal to W. R. Chapin.

Philadelphia Devotes First Meeting to Temple University Lecture Course

By Ralph W. E. Leiter

Philadelphia Chapter—Sixteen years ago this Chapter, seeing a real need for metallurgical training in the community, induced Temple University to establish an Evening Course in "Heat Treatment and Metallography of Steel."

Horace Knerr

From the beginning the members have been vitally interested in the course. They advertise it continually and aid in acquisition of equipment and supplies. They keep in close touch with its problems and policies through their Educational Committee. Their own Horace Knerr has been director of the course for many years. All the instructors and lecturers are members of the Chapter and teach in their spare time.

The course runs the full college year and includes 30 2-hr. lecture periods and 30 3-hr. laboratory periods, as well as plant visitations. The laboratory, with equipment originally valued at $10,000, is one of the best equipped of any eastern university.

As has been customary, the first meeting of the season was held at Mitten Hall, Temple University, on Oct. 2, and the entire evening was devoted to the educational course.

A metallurgical exhibit, "Science and Industry on Parade," was arranged with the cooperation of a number of educational institutions and several dozen local and national industrial companies. The interest in the exhibit was evidenced by an attendance of nearly a thousand persons in the afternoon and evening.

The meeting in the evening was called to order by Chairman Tom Nelson. He introduced Mr. Metzger who spoke for Charles E. Berry, president of Temple. Mr. Metzger praised the course highly and gave the Chapter much credit for its success.

Knerr Talks on History of Metallurgy

Horace Knerr then gave a very interesting talk on the history and romance of metallurgy. He closed by pointing out the tremendous progress made in metallurgy in recent years and how invaluable this progress has been to industry, transportation and communication.

Henry B. Allen, director of Franklin Institute and former chairman of the Chapter, spoke on "Metallurgy in Philadelphia." He began his interesting lecture with some early history of iron making and fabrication in this vicinity. Today there are some 3900 manufacturers in this area and over 600 of them are in the metal trades.

The need for the Temple Evening Course is apparent. That Philadelphia industries are profiting was shown by Mr. Allen in enlightening alumni statistics. Over 800 students have taken the course and they are from 99 different firms. Many of the alumni are salesmen and clerks while some have responsible executive positions. The present enrollment is 150 men.

Dinner Attended by 213

The dinner preceding the lecture was enjoyed by 213 members and guests. This tops all previous dinner meetings by about 50%. One of the brightest spots of the whole evening came after dinner when Theodore Wiedemann spoke to us on "Crossing the Atlantic on the Hindenburg." Mr. Wiedemann, President of Wiedemann Machine Co., is one of our oldest and most beloved members. His description of the Zeppelin was very interesting and the numerous human interest stories were most entertaining.

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RAY T. BAYLESS.....*Editor*
M. R. HYSLOP.....*Managing Editor*

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Henry Le Chatelier

THE American Society for Metals joins with friends and scientific organizations throughout the world in mourning the death on Sept. 17 at the age of 85 of the famous French scientist, HENRY LOUIS LE CHATELIER.

Professor Le Chatelier is perhaps best known to metallurgists for his studies of the laws of solid solubility and constitution of metallic alloys in general. The invention of the Le Chatelier thermocouple would alone have brought him world renown, but this was only a small part of his contributions to science, which covered the fields of chemistry and mechanics as well as metallurgy.

In 1904 Professor Le Chatelier founded the *Revue de Métallurgie*, now a leading French publication in this field. In 1908 he was elected a member of the Academie des Sciences, in 1913 he was made a member of the British Royal Society, and in 1917 was the recipient of the Davy Medal.

He was elected an honorary member of the American Society for Metals in 1922 on the occasion of the celebration of the 50th anniversary of his scientific career.

* * *

R. L. WARRY, technical representative, Stone-Franklin of Canada, Ltd., died in the Ross Memorial Hospital, Montreal, after an illness of a few months. He was a member of the Montreal Chapter.

Pitt Plans Twelve Lectures

Covers Field From Raw Materials to Finished Products

Covering the metals field from "Raw Materials to Finished Products," a course of 12 lectures has been arranged by the Pittsburgh Chapter for this season's educational fare.

Raw materials were discussed on Oct. 27 by Prof. S. L. Goodale. This is followed by lectures on the blast furnace, and on the various types of ferrous products such as bessemer, basic and acid open-hearth steel, wrought iron, electric and crucible steel, and cast iron.

Refractories, protective metal coatings, copper and brasses, bearing metals, and aluminum complete the wide range of products to be discussed at later meetings. Each lecture will be presented by an authority on the subject under discussion.

The course will meet on Tuesday evenings at 8:15 p. m. at the U. S. Bureau of Mines Auditorium, 4800 Forbes St., Pittsburgh.

Brazing Gives Advantages in Various Uses

H. M. Webber Explains Brazing Meeting Includes Inspection Trip and Dutch Lunch

By Kurt Siems

Cincinnati Chapter—Electric furnace brazing has a definite place among the various fabricating methods with certain advantages obtainable in no other way, according to H. M. Webber, industrial heating engineer, General Electric Co., in a talk illustrated with 60 lantern slides presented at the opening meeting on Sept. 10.

This meeting, which drew an attendance of 160, was held at the Queen City Steel Treating Co., where guests were allowed to inspect this new plant in full operation. The Queen City Steel Treating Co. is to be congratulated on the layout, equipment, and cleanliness.

Introductory remarks were made by E. P. Stenger, president, and N. M. Salkover, vice-president of the company, after which G. M. Enos and Carl Graves discussed the educational plans of the Chapter, and Stanley Binns outlined the membership campaign.

Reducing Atmosphere for Brazing

A pleasant surprise at the end of Mr. Webber's lecture was provided in the form of a Dutch lunch and three half-barrels of beer.

In electric furnace brazing, Mr. Webber explained, brazing metal is applied near the joints and the assemblies passed through an electric furnace with a reducing atmosphere. The brazing metal melts, flows over the surfaces and is drawn into the joints by capillary attraction, where it alloys with the base metal.

The work is then cooled in a controlled atmosphere chamber and delivered from the furnace with strong, tight joints and clean, bright surfaces.

Brazed Joints Withstand Impact

Many applications of the process were cited by Mr. Webber. For instance, brazed sub-assemblies for business machines have many times the strength of similar parts fabricated in other ways, and seem to withstand repeated impact better than pinned or riveted parts.

The development of the new long-range tear gas shells was also made possible by electric furnace brazing. They must withstand internal pressures up to 3000 psi. and the joints must obviously be strong and gas-tight.

Chapters May Use Churchill Lectures

Course on Physical Testing Is Published in Book Form

The lecture course on "Physical Testing of Metals" presented by Prof. H. D. Churchill of Case School of Applied Science during the recent National Metal Congress is now available to A.S.M. chapters for their educational activities.

The lectures have been published in book form at a price of $2.00 for individual copies, but will be supplied to chapters for distribution among those taking the course at a special price of $1.50 per copy.

Three other courses are available to the chapters. They are "Principles of Heat Treatment" by M. A. Grossmann, which is being presented this fall by the Buffalo, Detroit, New Jersey, Tri-City, and Worcester Chapters; "Tool Steels" by James P. Gill, being given by the York and Montreal Chapters; and "Fundamentals of Ferrous Metallurgy" by A. A. Bates, used by the Pittsburgh and Worcester Chapters.

James P. Gill, Campbell Lecturer, Is Speaker at Cleveland on October 5

By Hugh E. Brown

Cleveland Chapter was fortunate in having as speaker on Oct. 5 Mr. James P. Gill, who was to read the Campbell Memorial Lecture at the National Metal Congress on Oct. 21.

Chapter Chairman Harry Croft announced the plan for the Cleveland Chapter's activities in connection with the Metal Congress, and after dinner Ray A. Ride, head football coach and director of athletics at Case School of Applied Science, gave an interesting talk on the work of a football coach.

Reports were presented by Walter O. Kurtz, chairman of the Membership Committee and by Allan M. Thurston, chairman of the Convention Committee. Harry B. Pulsifer, technical chairman for the evening, then introduced Mr. Gill, who is metallurgist at Vanadium-Alloys Steel Co., Latrobe, Pa.

His subject was "Recent Developments in Tool Steels." Mr. Gill's splendid talk included all of the more common types, but touched especially on the newer developments in high speed materials.

Needless to say, those present at the meeting did not want to miss the Campbell Lecture.

Chicagoans Have Own WPA Project— Don't Use Shovels But They Really Dig

A heavy rain was just over and the storm clouds were drifting toward the horizon far to the east, when a passing farmer halted his team to inquire, "What ya doin', pardner? Goin' to lay some drain tile?"

There was no answer but clods of dirt still flew up from the hole.

"You wouldn't be needin' a team fer a couple days, would ye?" queried the ruralist.

Still no answer.

"Couldn't be a WPA project?" he spoke softly as dirt continued to fly.

"Hell no! It's the annual A.S.M. golf tournament," replied Herman as he climbed out of the trap mumbling some curt remarks about the maternal ancestry of the ball.

In spite of a few such minor difficulties, about 200 members and guests of the Chicago Chapter enjoyed a big day of golf followed by an equally large dinner at Glen Eagles Golf Club on Sept. 12.

The Chicago boys had to doff their hats to the Fort Wayne team who carried off the cup this year, although Ad Schied is still trying to convince the rest of his foursome that Don Smith's loudspeaker comments on Hugh Jerry's stance were responsible for a couple of dubbed shots.

As usual, a large number of prizes were awarded, and those who did not qualify received as a souvenir a handy clothes brush and shoe duster in leatherette case.

Paul Kurtz, chairman of the Entertainment Committee, and Don Smith, chairman of the Golf Committee, with their assistants, must be complimented upon the big time which everyone enjoyed.

GLEANINGS
From the Chapters

We don't like to brag, but—

On Oct. 1, 1936, all records were broken with a new all-time high of 7691 A.S.M. members. But on Nov. 1 records were shattered to smithereens with a jump above the 8000 mark to 8249!

Credit for 558 new members in one month goes, of course, to the best Metal Congress and Exposition on record, to a fine new Handbook just issued, and, above all, to 41 chapters who are out to do big things this year as they never were done before.

More Figgers

Cleveland, with the advantage of being the location of the Metal Congress, brought in a grand total of 95 new members; Pittsburgh wasn't far behind with 84, Rochester had 59, Chicago 47, Detroit 36. Eight other chapters reported between 10 and 27 new members.

The highest membership ever reached by an individual chapter was also hit this month when Chicago chalked up a total of 803. Cleveland is next with 703, and Pittsburgh is only two below the 700 mark.

Greetings From New Jersey

Chapter Secretary J. L. Auer sends us the following note to transmit to the other chapters:

"The New Jersey Chapter wishes to thank the various associated chapters who have forwarded their season's technical and educational programs, and wishes to advise that each chapter's chairman and secretary has been sent the New Jersey Year Book.

"We cordially invite the members of the affiliated chapters to our coming meetings and earnestly request that they make their presence known so that we can see that they are properly entertained."

Food Isn't All

Secretary Kurt Siems of Cincinnati reports the most successful opening meeting the chapter ever had (see col. 2). It seems that an excellent "Dutch lunch" was served at the end of the meeting, but the record attendance couldn't be attributed to this fact because it was not announced and came as a complete surprise.

Kurt was cynical enough to believe that the prospect of food sometimes brings men who wouldn't be interested otherwise. But it seems a fine program is also a good drawing card.

Students, Take Note

Frank W. Kasdorf, Jr. writes to express his appreciation for all the A.S.M. has done for its student members at Case School of Applied Science, Cleveland. He has been a junior member there for the past three years and is now a sales apprentice for Aluminum Co. of America, Pittsburgh.

Watch in a future issue of this paper for a complete story about student groups and junior members.

New Books for Old

Only about 5000 new Handbooks have been issued so far, and that means that some 3000 members are still using their old editions. There are plenty to go round, of course, but you will be much more up to date if you get this larger and improved volume right away.

All you have to do is to send in your old 1933 edition to the National Office, and the postman will bring this nice new book right back to you.

And More to Come

Note the numerous reports of chapter lecture courses scattered throughout this issue. We hope to print a good bit more about this very important chapter activity during the season.

Foley Discusses Developments in Making of Steel

By Emerson S. Norris

Baltimore Chapter—An encouragingly large attendance of 83 members and guests, plus a fine program, made Baltimore's first meeting of the season, on Oct. 12, a great success.

At a Speaker's Dinner preceding the meeting it was brought out that 17 members added to the Chapter in the past year have raised the membership to over 65.

Francis B. Foley, director of metallurgical research of the Midvale Steel Co., was the speaker. His fine talk on developments in steel making was well supplemented by lantern slides of the various melting furnaces and ingot structures.

Following his discussion of the various processes of steel manufacture, he spoke at length on grain size—its importance, control, and theory.

An additional feature of the meeting was a moving picture, "The Saga of Fine Steels," illustrating the manufacture of alloy steels at the several plants of Ludlum Steel Co. It was the first public showing of the picture, and A. W. F. Green of that company enlivened it with comments and descriptions.

Numerous color shots of electric furnaces, forging, and rolling were exceedingly good. The reasons for the high cost of alloy steels were admirably illustrated by excellent views of heat treating, inspection, finishing, and handling.

French Describes Recent Progress in Alloy Steels Notable in Four Fields

By E. V. Peterson

Northwest Chapter—Progress in alloy steels has been notable in four fields in recent years, it was pointed out by H. J. French, speaking on this subject at the opening meeting, Sept. 14.

First, methods of steel making have been improved. Second, the use of low alloy steels has been extended. Third, improvements have been made in atmosphere control in heat treating, and, last, the use of alloy steels in welded structures has been further extended.

In addition to the usual lecture series, the Chapter is making plans to present an educational course of six lectures during the winter. A series of three or four plant visitations has also been proposed. In order to stimulate interest in the dinner meetings, the organization of discussion groups is being considered for this season.

Chairman Dewey Hult promises to make this a banner year in Northwest history and has delegated William I. Sweet to head a "get acquainted" committee in order that all the members will know one another from the very start.

Schwartz Talks at Buffalo

By B. L. McCarthy

Buffalo Chapter—Outlining the most recent developments in the field of ferrous alloys, Dr. H. A. Schwartz, manager of research for the National Malleable and Steel Castings Co., spoke on ferrous castings on Thursday, Sept. 17.

Dr. Schwartz, who is the author of a book entitled "American Malleable Cast Iron," illustrated with lantern slides the phases of alloying in steel, malleable iron and cast iron.

Plans were completed for the tour of the Bethlehem Steel Co.'s new sheet mill which the group will make on October 10.

Albert Sauveur Achievement Medal Awarded to Chapin at A.S.M. Banquet

Early Research on Hardening Is Recognized

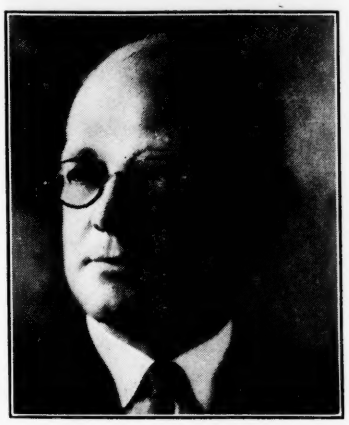
W. R. Chapin, director of research and testing, E. C. Atkins & Co., Inc., Indianapolis, Ind., was awarded the Albert Sauveur Achievement Medal at the Annual Banquet of the American Society for Metals on Oct. 22 during the National Metal Congress in Cleveland.

The purpose of this award is to "recognize a metallurgical achievement which has stimulated other organized work along similar lines to such an extent that a marked basic advance has been made in metallurgical knowledge."

Mr. Chapin's fundamental work on the hardening of steel, results of which were reported in the *Transactions* of the American Society for Steel Treating in 1922, was instrumental in stimulating many important researches which led to our present knowledge of this phenomenon.

Mr. Chapin is the third recipient of the medal, which was presented by Dr. Sauveur himself after a preliminary introduction by Dr. Zay Jeffries, recipient of the award in 1935.

Chapin is a graduate of the State Normal College in Florence, Ala., and attended the University of Alabama. After several years as chief metallurgist for Cleveland Twist Drill Co., he became associated with E. C. Atkins & Co. where he is now director of research. Several years ago he also organized his own firm, the W. R. Chapin Company.



W. R. Chapin

In accepting the medal, Mr. Chapin stated that "the real joy of research comes from the realization that when such work is turned over to industry it ultimately results in the making of better products at less cost so that everybody benefits. . . .

"This award is accepted, not for myself alone, but for all those who have gone before, and particularly for the men in the mines, in the mills, and in the hardening shops, for the Indianapolis Chapter, for my business associates and my family."

West Coast Members Meet d'Arcambal, Hear Talk on Cutting Tools and Gages

By C. W. Horack

Golden Gate Chapter—Although the activities of A. H. d'Arcambal in the metallurgical field have often been heard of and read about on the West Coast, many of the members had not had the opportunity to meet him personally until his address to 150 members at the meeting on Sept. 21.

Mr. d'Arcambal is consulting metallurgist for Pratt & Whitney Co., and spoke on "New Developments in the Cutting Tool and Gage Fields."

Mr. d'Arcambal discussed the importance of proper tool design to meet specific conditions; the standard run of tools cannot always be expected to deliver 100% performance on all kinds of work. This implies more cooperation between tool manufacturer and user.

The 18-4-1 type of high speed steel still predominates as the most popular cutting tool material, although Stellite, tungsten and tantalum carbide tools are being extensively used on many production jobs. The time spent in finish grinding and lapping carbide tools in particular was said to increase the life and performance over similar ones ground in the ordinary way.

Chromium plating prolongs the life of gages considerably. Plating on cutting tools is not considered desirable except in a few special cases. One instance the speaker mentioned was a high speed slitting saw with chromium plated sides. Adherence of fine cast iron dust to the sides is considerably reduced by plating, with consequent reduction of scoring and friction between cutter and work.

Heat treating and nitriding of cutting tools were discussed at some length, and lantern slides showed some of the latest designs in various types of tools. An exhibit of small tools and gages was also provided.

An exceptionally large number of manufacturing executives of the San Francisco Bay district were present at this meeting, and many questions from the floor were answered.

Worcester Chapter Sponsors Physical Metallurgy Course

The Worcester Chapter has announced an evening educational course on "Physical Metallurgy" being held at Worcester Polytechnic Institute.

Carl G. Johnson, secretary-treasurer of the Chapter, is the instructor. Tuition is $15.

This course is intended to supply a background of information which will be of service in the solution of problems and difficulties encountered during the selection, shaping, treating and testing of metals and alloys. It includes illustrated lectures, discussion periods and laboratory work.

More than 50 men were enrolled for this course when it was presented last year by the Chapter.

Grossmann Lectures Form Section of Jersey Course

A lecture on "Manufacture of Iron and Steel" by Wilbur E. Harvey of John A. Roebling's Sons Co. opened the Fall Course in Ferrous Metallurgy of the New Jersey Chapter on Oct. 30.

"Low Alloy Steels" were discussed by A. B. Kinzel, Union Carbide & Carbon Corp. on Nov. 6, and "Stainless and Heat Resistant Steels" by Walter M. Mitchell, Carnegie-Illinois Steel Corp., on Nov. 13.

The remainder of the course, which ends Dec. 18, will be devoted to a presentation by J. J. B. Rutherford of U. S. Steel Corp., of the series of Grossmann lectures on "Fundamentals of the Heat Treatment of Steel," and a talk on "Practical Heat Treatment" by Sam Tour of Lucius Pitkin, Inc.

Plans for the spring course of the New Jersey Chapter will be announced at a later date.

Acoustics Are Explained for Ontario Group

Engineering of Musical Sounds Demonstrated by White

By J. W. McBean

Ontario Chapter—"Musical Sounds and Their Engineering" was the subject of the opening meeting, held at the Royal York Hotel on Oct. 2, addressed by Dr. William Braid White, director of acoustic research for the American Steel & Wire Co., Chicago.

This meeting was sponsored jointly by the local branches of the A.S.M., the Engineering Institute of Canada, and the American Society of Mechanical Engineers.

Entertainment was provided by Stanley St. John and his Orchestra, who also cooperated with Dr. White in the sound demonstrations.

Strings Vibrate in Segments

Dr. White used experiments freely in illustrating his lecture. A single component tone was given by striking a metal bar, and then using a long string with varying tension it was shown that strings and wires will not vibrate as a whole but in two, three, four, or more segments according to conditions, and will give notes containing a series of harmonics which determine the particular quality or color of the sound. The wave forms will vary from the same fundamental note on different instruments, and even on the same instrument played by different performers.

A demonstration was given on the piano showing that the vibrations of one string are transmitted by the bridge to other strings, which ordinarily give the second, third, fourth or other harmonics of the first string.

Unique Instrument Developed

A projection oscilloscope with a rotating mirror was used in connection with a microphone and amplified to show the wave forms of different sounds. This equipment, the only specimen of its kind in existence, was developed by collaboration between the American Steel & Wire Co. laboratories, Westinghouse Electric & Mfg. Co. and Bausch & Lomb Optical Co.

A single component wave was shown and then various complex waves such as the wave forms of the various vowel sounds, and the changes in form which occur with variations in loudness. The wave forms from the piano, violin, cello, bass viol, cornet, saxophone, trombone and several other instruments were shown by the oscilloscope.

Wave Forms Projected on Screen

On each of the stringed instruments the effect of playing the same note on different strings was shown. For instance, the open A was played on the next string and on the third string, and the differences in wave form were projected on the screen.

Dr. White briefly summed up the facts which are of importance in view of the great advances made recently in radio and sound engineering.

Course on Cast Metals Given

The educational course sponsored each year by the Los Angeles Chapter was announced at the October meeting. The course this year comprises a series of ten lectures on the subject of Cast Ferrous Metals.

These lectures are to be conducted by Mr. Gregg of the Reliance Regulator Corp. and G. B. Tibbetts of the Los Angeles Steel Casting Co.

Pioneering at Boulder Dam Is Described

Transmission Line From Dam To Los Angeles Cost 23 Million

By Louie W. Mosley

Los Angeles Chapter—"The Modern Pioneer" was the subject of a talk by H. H. Cox of the Los Angeles Municipal Department of Water and Power at the meeting on Oct. 15. Mentioning that Los Angeles had done much pioneering and been credited with many "firsts" in water and power engineering feats, he proceeded to illustrate by motion pictures the most recent and one of the greatest.

The picture dealt with the main constructional features of Boulder Dam, particularly the great transmission line, the engineering and responsibility for which is entirely in the hands of the Los Angeles Bureau of Power and Light.

The transmission line, taking three years to complete and costing $23,000,000, will consist of two circuits extending 266 miles from Boulder Dam to Los Angeles. It will carry the record high voltage of 287,000 volts, and will transmit a maximum load of 240,000 kilowatts. The transformers at the receiving end will be the world's largest, each weighing approximately 372,000 lb.

Years of preliminary work preceded the actual construction of this power line, the receiving station having been laid out in 1926.

Construction of Cable

For the transmission cable itself a minimum outside diameter of 1.4 in. was determined upon. Three constructions were submitted to the Bureau, the one winning the contract award being a hollow tube composed of ten interlocking strips, spirally fabricated by a special machine which applied a coating of graphite in the dove-tail joints between the strips to give the cable exceptional flexibility.

The exterior was quite smooth, and the thin shell made possible a conductor of the specified outside diameter with a minimum of weight and a consequent saving in tower strength and cost.

In their study of conductors the Bureau developed a vibration dampener of a cheaper and more efficient type than had before been available, for reducing wear and fatigue in the cables due to low velocity winds.

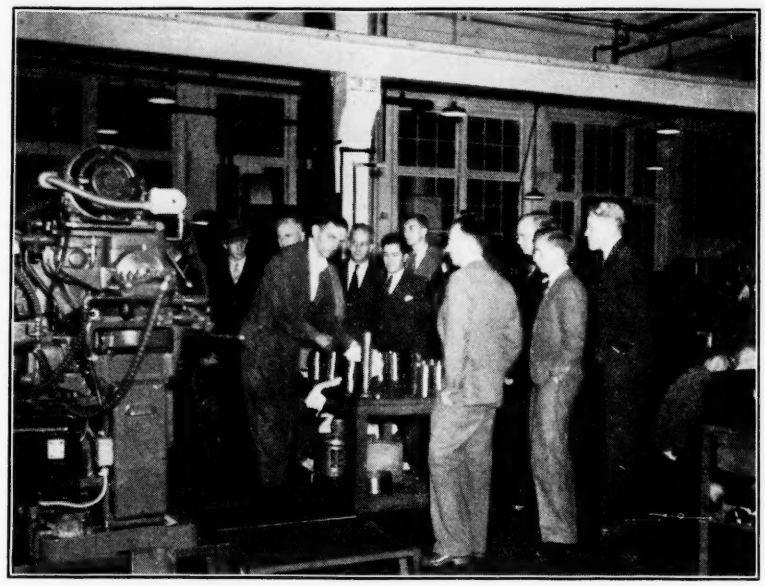
City System Converted to 60 Cycles

Connecting the Boulder Dam transmission line in with the Los Angeles municipal light and power system presented a serious problem in that the city system up to the present has been 50 cycles whereas for reasons of economy the new generator and transmission system was designed for 60 cycles.

The various savings made possible by the use of 60 cycles in the transmission line pointed to the advisability of converting the entire system from 50 to 60 cycles at this time, and the Bureau accepted the responsibility of changing all consumers' electrical equipment to operate satisfactorily on the new frequency. The voltage was also changed from 110 to 120.

The biggest problem was the electric clock, and the easiest solution for the less expensive ones was simply to present the consumer with a new clock. Making the required alterations to compensate for the frequency change required the services of all the available competent electricians in the western states.

Inspecting Machine Tools at Heald Plant



Members of the Worcester Chapter spent over an hour taking a well-organized inspection trip through the Heald Machine Co. An interesting history of the firm by W. J. Guild, consulting engineer, prefaced the trip.

Columbus Has Program of Athletic Character

By Oscar E. Harder

Columbus Chapter—The entire program of the opening meeting on Tuesday, Sept. 22, at the Central Hotel in Worthington, was athletic in character.

The dinner was a kind of rodeo with reference to the champion for handling fried chicken and corn on the cob. After this competition E. R. Godfrey, assistant coach at Ohio State University, talked on "Football Prospects at Ohio State," and Michael Peppe, swimming coach, talked on his impressions of the 1936 Olympic games.

The attendance at this meeting was in excess of the total membership of the Chapter.

'Billy' Williams Honored

By *W. E. Remmers*

Guest of honor of the Chicago Chapter Executive Committee at a dinner held at the Fred Harvey Restaurant on Monday evening, Nov. 2, was W. E. "Billy" Williams of Metal Lubricants Co. The occasion was a tribute to his many years of untiring service and activity in the Society.

At the conclusion of the dinner, Chairman Calef expressed the Chapter's deep appreciation of Billy's work. A small gold A.S.M. lapel emblem was then presented to him bearing his initials and the year 1918 (the date when he first became so strongly devoted to the Society).

Billy Williams' dependable interest and untiring effort class him as one of the veterans of long and active service to the Society. He is truly appreciated.

Washington Chapter Sponsors Only Metal Course in District

On Oct. 26 the Washington Chapter started an educational course with a total attendance of 114 members.

This is the only metallurgical course of any character offered in the Washington district, none of the local schools teaching the subject. It is therefore being received with considerable enthusiasm.

The lecture course deals with the more theoretical aspects of metallurgy and has been coordinated to a large extent with the regular chapter meetings, which are more practical.

Diagrams, Slides Show Control of Gas Atmospheres

By A. W. Demmler

Pittsburgh Chapter—R. J. Cowan, metallurgical engineer, Surface Combustion Corp., opened the season on Sept. 10 with an excellent talk on "Atmosphere Control as Applied to Heat Treating Metals."

(In order to confine himself to his subject, the speaker carefully read over the title at the beginning of the meeting and thus fought off the natural tendency to discuss the weather which was certainly in need of heat control.)

Equilibrium diagrams were shown for various gas atmospheres but, unfortunately, in practice these figures cannot be read off too literally because the material of which the furnace chamber is built may catalyze a certain reaction with the result that perhaps a rainbow finish might be obtained where the laboratory developed a bright anneal.

Mr. Cowan also discussed the different results obtained on a 0.20% carbon steel and on a high carbon steel under the same furnace atmosphere.

On the screen, a number of commercial installations were shown to demonstrate the various practices, which include radiant tube heating, flame screens and gas cracking units.

Chicago Members Suggest Lecture Course Subjects

Subjects covered in the lecture course of the Chicago Chapter include many suggestions made by members of the Chapter in a questionnaire.

The series was inaugurated on Oct. 15 by Prof. Arthur Howe Carpenter, associate professor of metallurgy, Armour Institute of Technology, speaking on "The Source of Metals." He discussed the geological occurrence of the principal metals and ores before an audience of 150.

Nine other lectures are planned for the course, which will be completed on March 4, 1937. Corrosion of metals, principles and applications of heat treatment, cold working and drawing of non-ferrous metals and of steel, physical testing and inspection, fatigue of metals, and metallurgical and heat treating furnaces will be discussed by experts in each field.

Members Visit Machine Shop

Worcester Chapter Is Guest of Heald Machine Co., Hears History of Plant

Worcester Chapter—"We take pride in welcoming you to the plant of the Heald Machine Co. because we feel that your visit is a compliment, not only to the machines we build here and to the factory in which we build them, but also to the progressive pioneering spirit back of the product and the factory."

A.S.M. members were thus welcomed by W. J. Guild, consulting engineer, The Heald Machine Co., which was host for the first regular meeting of the season. An inspection trip and history of the plant attracted 95 members.

History Dates Back 110 Years

Mr. Guild's history of the firm started 110 years ago with Stephen Heald's machine shop in Barre, Mass. An iron foundry was established in the early 50's, and as manufactured abrasive began to replace emery and sand for grinding, the pioneering spirit carried Leander S. and James N. Heald, son and grandson of Stephen, into the development and marketing of drill grinders, center grinders and similar tools.

It was this grandson, James N. Heald, who organized The Heald Machine Co. in Worcester in 1903. Seeing the possibilities in the then young automobile business, he developed single purpose hole grinding machines, considered quite a folly at that time when an attachment on a universal grinding machine could do the job. Nevertheless the machines sold.

Individual Drives Developed

Mr. Guild traced the development of individual motor drives on machines, hydraulic mechanisms for faster, quieter and more flexible operation, of anti-friction bearings, automatic sizing devices, improvements in materials, construction and appearance.

The company's grinding machine lines have been broadened in range, and a new method of internal grinding, known as the centerless internal method, has been introduced to the trade. The recent years of depression have seen the design and introduction of a complete new line of precision boring machines.

Following Mr. Guild's address, 110 members and guests spent over an hour inspecting the plant.

Talks on Arc Welding

C. H. Jennings Speaks at Tri-City Opening Meeting

Tri-City Chapter—About 90 were in attendance at the opening meeting of the season Tuesday evening, Sept. 22, at the Rock Island Arsenal Auditorium.

Coach Ossie Solem of Iowa University spoke briefly on the problems confronting a coach in selecting men for a team. They must be alert both mentally and physically, but most of all they must have a fighting heart.

Charles H. Jennings, research engineer with Westinghouse Electric and Mfg. Co., then followed with an interesting and educational discussion of "Recent Developments in Arc Welding." Mr. Jennings brought out the fact that the new developments in welding machines and welding rod emphasize the necessity of proper procedure in attaining a good weld. First the weldability of the metal must be known, then proper design of parts to be welded, and finally and most important, proper welding technique.

HERE AND THERE WITH A.S.M. MEMBERS

Edgar C. Bain, President American Society for Metals

EDGAR C. BAIN, assistant to the vice-president, United States Steel Corp., and newly elected president of the American Society for Metals, was given the honorary degree of doctor of engineering by Lehigh University on Oct. 7.

December's *Metal Progress* will contain a full-length biography and appreciation of the new president.

Other officers whose election was confirmed at the Annual Meeting of the Society, held Wednesday morning, Oct. 21, during the National Metal Congress, are as follows:

For vice-president: GEORGE B. WATERHOUSE, professor of metallurgy, Massachusetts Institute of Technology.

For secretary: W. H. EISENMAN.

Two new trustees are OWEN W. ELLIS, director of metallurgical research, Ontario Research Foundation, and RALPH L. WILSON, metallurgical engineer, Timken Steel & Tube Co.

* * *

E. L. KNAPP as taken a position with the Bethlehem Steel Co. for the Lackawanna Mill, and will be located in Detroit.

Mr. Knapp's varied experience includes a year in Russia in 1932-33 as metallurgist for the Cheliabinsk Tractor Co. This followed his graduation from University of Michigan in 1925 and successive employment by the Shafer Bearing Corp., Caterpillar Tractor Co., and American Cyanamid Co.

Upon returning from Russia, he spent another year at Michigan and emerged with his Master's degree. His latest position was as metallurgist for Universal Products Co., Detroit.

* * *

T. L. JOSEPH has resigned from the Bureau of Mines to take a position as professor of metallurgy with the Minnesota School of Mines and Metallurgy. Mr. Joseph has conducted blast furnace investigations for the Bureau of Mines since 1919.

For the past year he supervised a plant investigation conducted jointly by the Inland Steel Co. and the Bureau of Mines on the effect of oxides in pig iron on the oxides in basic open-hearth steel. F. W. Scott, who made the oxide determinations in this investigation, has resigned from the Inland Steel Co. and will be associated with Mr. Joseph in teaching and in conducting research.

* * *

STEPHEN FEDUSKA is now associated with United Engineering & Foundry Co. as metallurgist. He was formerly assistant to the director of metallurgy for Continental Roll & Steel Foundry, where he specialized in iron and steel roll development, metallurgy and heat treatment of large and small alloy steel castings. He is a graduate of University of Pittsburgh.

PAUL S. LANE, chief metallurgist of the Koppers Co., American Hammered Piston Ring Division, Baltimore, has assumed his new duties as metallurgical research engineer.

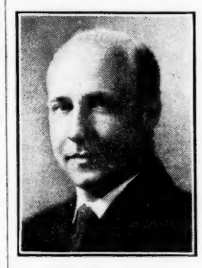
Mr. Lane is secretary-treasurer of the Baltimore Chapter, A.S.M. and writes the reports of Chapter meetings for THE REVIEW. He is also a member of the American Foundrymen's Association and the Society of Automotive Engineers.

A new physical testing laboratory and enlarged dynamometer room have recently been completed by the Koppers Co. to permit of more extensive research into piston ring and engine problems.

On the basis of his broad experience in piston ring work, Mr. Lane will present a paper at the 1937 convention of the American Foundrymen's Association entitled "Some Experiences With Wear Testing."

* * *

SO POPULAR was GILBERT E. DOAN'S address on "Invisible Rays in Modern Engineering," presented before the Second Biennial Inter-Chapter Meeting at Penn State last spring, that several of the participating chapters are inviting him to repeat it at their local meetings this winter. Dr. Doan will present the lecture at Philadelphia, Pittsburgh, Southern Tier, and York Chapter meetings during the season.



G. E. Doan

The original address was presented as an invitation lecture before the Franklin Institute in Philadelphia in 1932. It is primarily an account of the discovery of gamma ray radiography in which Professor Doan was engaged while at the Naval Research Laboratory during a leave of absence from Lehigh University, where he is associate professor of metallurgy.

* * *

AFTER graduation from Massachusetts Institute of Technology, WALTHER H. MATHESIUS, son of A.S.M. Ex-Trustee Walther Mathesius, is employed at the United States Steel Corp. Research Laboratory, Kearny, N. J.

* * *

GORDON MCMILLIN is now metallurgist in charge of control of metals for Buckeye Traction Ditcher Co., Findlay, Ohio.

Mr. McMillin was metallurgist at Chicago Steel Foundry Co. for 9½ years, and recently spent two months installing the laboratory at Western Foundry Co., Chicago.

* * *

O. W. WINTER is now industrial engineer at Kent Owens Machine Co., Toledo, Ohio.

He was formerly general manager of the Cutter and Special Tool Division of Whitman & Barnes, Inc., and before that was associated with the Cincinnati Milling Machine and Cincinnati Grinders, Inc.

* * *

FURTHER expanding its metallurgical service in the Detroit area, Union Drawn Steel Co., Massillon, Ohio, has announced the addition of JAMES R. BUCHANAN to the field metallurgical staff in Detroit.

A graduate of Michigan State, Mr. Buchanan was formerly associated with the Metallurgical Department of Chevrolet Motor Car Co. in Flint, Mich. He joined the Metallurgical Department of Union Drawn Steel Co. in April 1936.

ON NOV. 1, H. B. WISHART joined the metallurgical laboratory of Carnegie-Illinois Steel Corp., Gary, Ind.

H. B. Wishart

Since 1932 he has been associated with the Engineering Experiment Station, University of Illinois, as a special research assistant for the Rails Investigation, which is now nearly completed. One of the results of this investigation was the presentation at the 1936 Metal Congress of a paper in collaboration with S. W. Lyon on the "Effect of Overload on the Fatigue Properties of Several Steels at Various Low Temperatures."

Mr. Wishart received his Master of Science degree in theoretical and applied mechanics from the University of Illinois in 1932.

* * *

USING half of his time for teaching and half for research, MAURICE C. FETZER has assumed the duties of assistant professor of metallurgy and metallography at State College of Washington, Pullman, Wash. He was formerly with the American Steel & Wire Co.

* * *

FORMERLY metallurgical consultant and district manager of sales in Detroit, JOHN H. FRYE has been appointed metallurgical engineer for Columbia Steel and Shafting Co. at the main office in Pittsburgh.

He is also metallurgical engineer for the Edgar T. Ward's Sons Co., the warehousing subsidiary.

* * *

THE A.A.A. Contest Board has appointed W. R. CHAPIN, metallurgist, E. C. Atkins & Co., and S. A. SILBERMANN, electrical engineer, Claude S. Gordon Co., both members of the Indianapolis Chapter, as judges for the Indianapolis Speedway 500-mile race.

W. B. THOMPSON, Montreal Chapter, A.S.M., formerly assistant to C. M. Carmichael, general manager, Shawinigan Chemicals, Ltd., Stainless Steel and Alloys Division, has been transferred to St. Catharines, Ont, and is now manager of the Ontario office.

* * *

IN ADDITION to his duties as metallurgist for Cleveland Rock Drill Co., WALTER H. CLARK has assumed the position of metallurgist for Cleveland Pneumatic Tool Co.

* * *

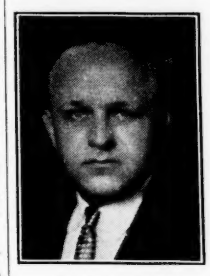
AFTER 13 years on the teaching staff of Massachusetts Institute of Technology, J. H. ZIMMERMAN has resigned to take charge of the Newark Development Laboratory of The Linde Air Products and associated companies.

* * *

J. W. WEITZENKORN, former president of the Molybdenum Corp. of America, has become associated with the Ohio Ferro-Alloys Corp. at Canton, Ohio, as director of research.

* * *

SOUTH AMERICA claims J. S. VANICK, Development and Research Division, International Nickel Co., for several months this winter. He is traveling with E. F. Feely, representative of the company in South America.



J. S. Vanick

The purpose of this trip is to offer consultation service to industrial executives and engineers on problems involved in the production and application of nickel alloys.

The month of October was spent in Brazil, during November their headquarters have been in Buenos Aires, Argentina, and in early December they will visit Chile, and may be reached at the South American Metal Co. offices in Santiago.

Life of Cutting Tools Depends On 4 Factors

Design, Steel, Hardening, Finish Discussed by d'Arcambal At Los Angeles

By Louie W. Mosley

Los Angeles Chapter—Two items of interest to the members were announced at the dinner meeting on September 17. They were that a complete set of by-laws had been drawn up for the Chapter during the summer, and that a directory of the membership had been issued containing a copy of the by-laws and the program for the season 1936-37.

A. H. d'Arcambal

J. E. Wilson of Climax Molybdenum Co. was appointed as representative of the Los Angeles Chapter to the Metal Congress.

A. H. d'Arcambal then proved himself to be an able and interesting speaker on the subject of "Latest Development in Modern Gages and Tools."

Many Tools of Special Design

He mentioned four factors as governing the life of cutting tools: Design, steel, hardening, and finish.

At the present time 50% of all cutting tools are of special design, that is, not regularly listed in catalogs. Mr. d'Arcambal attributed this to the wide use of special steels in the manufactured product, of which there are more on the market today than ever before.

Some of the new types of high speed tool steels contain 8 to 10% cobalt with high carbon. They are limited to boring tools and tool bits, some taps, reamers, cutters and drilling tools.

The steel known as 18-4-2 is used in many automobile factories for high speed cutting tools, but is too brittle for many uses. One automobile manufacturer, however, specifies 18-4-2 exclusively for making broaches.

Mo-Tung and Mo-Max steels were developed during the World War. They are difficult to harden, owing to the formation of molybdenum oxide, but the salt bath has been satisfactory for this purpose.

Tungsten carbide generally supplies the hardening power. Tantalum carbide is a little tougher and tungsten carbide tools, owing to their brittleness, are more generally used for turning cast iron, bakelite, and non-metallic materials than for steels.

Double and Triple Draw

A great deal of work is now being done on the double and triple draw of high speed tool steels. Tools quenched at 2380° F., given a double draw at 1050° F., and cooled below 350° F. between draws, give longest life. If not allowed to cool down to that temperature, high speed steel has not acquired its full hardness. For that reason, the Pratt & Whitney Co. insists that its material for high speed cutters be handled by hand between the quench and draw.

The nitriding of cutting tools gives a very hard surface, and tests on reamers showed a 50 to 100% longer life.

Chromium plated gages had 20 times more life than unplated gages. Another important use for chromium plating is to build up worn places on gages that have been ground under-size.

Discussing finish of tools, Mr. d'Arcambal stated that polished flutes on drills are working out to great advantage. However, taps that have been quenched and drawn only, and left unground, are better than when ground after heat treating, or "hardened and ground."

In concluding his talk, Mr. d'Arcambal gave an interesting discussion regarding the early troubles that were encountered in the manufacture of standard gage blocks with absolute stability and with little or no temperature expansion, for the Bureau of Standards.

Gas Carburizing Theory Explained At Southern Tier

By K. J. Mackenzie

Southern Tier Chapter—The theory of gas carburizing was described in detail by R. J. Cowan, metallurgist, Surface Combustion Corp., at the first meeting of the season, held Sept. 21 at the Jenkins Inn, Waverly, N. Y. Mr. Cowan's subject, which he illustrated with an excellent series of lantern slides, was "Continuous Carburizing and Nitriding Furnaces."

He explained the differences between a carbon monoxide case and a methane or hydrocarbon case, and told how the metallurgists have overcome the inherent faults of each type by using a combination of the two types.

Some interesting cost figures compared gas carburizing with pack carburizing. Mr. Cowan also said that there was a trend toward replacing cyanide case with case produced by gas carburization.

In discussing nitriding, Mr. Cowan explained the principle of the process and showed how correct procedure had been determined by various experiments with varying degrees of dissociation of ammonia at various combinations of temperatures.

The interesting discussion which followed the talk was indicative of the fine manner with which Mr. Cowan handled the subject.

Discussion Groups Meet

Believing that the educational group meetings inaugurated last year contributed much toward increasing the membership, the Cincinnati Chapter is continuing them this season.

One group on "Fuels and Furnaces" under the leadership of E. W. Esslinger has just completed a series of seven discussions, and another on "Welding" under M. H. Brumble will hold a final meeting on Dec. 8.

A third group on "Theoretical Metallurgy" has been organized under the direction of Dr. John Chipman of American Rolling Mill Co.

As in the past, the Chapter is also sponsoring evening courses at the University of Cincinnati.

Lecture and Lab Courses are Sponsored by Golden Gate

The course in practical metallurgy sponsored by the Golden Gate Chapter opened early in the fall.

For some years this educational work has been carried on in cooperation with Humboldt Evening High School. No tuition charge is required and only a nominal laboratory fee.

A course of 18 lectures is provided in both ferrous and non-ferrous metallurgy, and is a pre-requisite to the laboratory courses in these subjects. An advanced laboratory course in ferrous metallurgy is provided for those who have taken the lecture course and the beginners' laboratory course.

CHAPTER DIRECTORY AND CALENDAR

BALTIMORE CHAPTER
Secretary—Paul Lane, American Hammered Piston Ring Co.

BOSTON CHAPTER
Secretary—H. E. Handy, Saco-Lowell Shops, Biddeford, Me.
Dec. 4—Welding.
Jan. 8—The Making of Alloy Steel..... Motion Picture

BUFFALO CHAPTER
Secretary—B. L. McCarthy, Wickwire-Spencer Steel Co.
Dec. 10—Selection of Alloy Steels.
Jan. 14—Fatigue of Steel.....G. R. Brophy

CANTON-MASSILLON CHAPTER
Secretary—W. J. Bischoff, Timken Steel & Tube Co.
Jan. 21—Corrosion.....F. N. Speller

CHICAGO CHAPTER
Secretary—K. H. Hobbie, 1140 Washington Blvd.
Dec. 10—Nickel Alloys.....E. M. Wise
Jan. 14—National President's Night..E. C. Bain
Jan. 28—Properties of Tool Steel..... M. W. Dalrymple

CINCINNATI CHAPTER
Secretary—Kurt Siems, Cincinnati Milling Machine Co.
Dec. 10—Metallurgical Control.....F. R. Palmer
Jan. 14—Plastics as Related to Metals.

CLEVELAND CHAPTER
Secretary—Hugh E. Brown, W. S. Tyler Co.
Dec. 7—Modern Forging Practice..... R. W. Thompson
Jan. 4—Relationship Between Metallurgist and Sales Department..L. S. Hamaker

COLUMBUS CHAPTER
Secretary—E. C. Stein, Columbus Auto Parts Co.
Dec. 8—Metallurgical Control.....F. R. Palmer
Jan. 12—Plastics as Related to Metals.

DAYTON CHAPTER
Secretary—Fred M. Reiter, Dayton Power & Light Co.
Dec. 9—Metallurgical Control.....F. R. Palmer
Jan. 13—Plastics as Related to Metals.

DETROIT CHAPTER
Secretary—W. P. Eddy, Jr., P.O. Box 590, Pontiac, Mich.
Dec. 14—Christmas Party.
Jan. 11—Automotive Sheet Steels.....J. Winlock
Grain Size in Non-Ferrous Metals ..... Clair Upthegrove

GOLDEN GATE CHAPTER
Secretary—R. S. Hirst, 2142 Ward St., Berkeley, Calif.

HARTFORD CHAPTER
Secretary—C. T. Hewitt, Fafnir Bearing Co.
Dec. 8—Grinding.....H. W. Dunbar
Jan. 12—Metal Cleaning Processes..T. D. Taylor

INDIANAPOLIS CHAPTER
Secretary—Harry J. Green, Diamond Chain & Mfg. Co.

LEHIGH VALLEY CHAPTER
Secretary—Humphrey L. Fry, Bethlehem Steel Co., Bethlehem, Pa.
Dec. 4—Alloy Steels.....A. B. Kinzel
Jan. 8—High Speed Steels.....J. P. Gill

LOS ANGELES CHAPTER
Secretary—E. C. Black, The Midvale Co., Los Angeles.
Jan. 14—High Strength Cast Iron...M. T. Davis

MAHONING VALLEY CHAPTER
Secretary—B. F. Anthony, Youngstown Sheet & Tube Co., Youngstown, Ohio.

MILWAUKEE CHAPTER
Secretary—Ernest G. Guenther, Wisconsin Motor Corp.
Dec. 17—Non-Ferrous Talk.....Mr. Fuller
Jan. —President's Night.

MONTREAL CHAPTER
Secretary—B. W. Brownrigg, P.O. Box 371, Station "H."

MUNCIE CHAPTER
Secretary—James H. Miller, Indiana General Service Co.
Dec. 11—Christmas Party.

NEW HAVEN CHAPTER
Secretary—A. V. Pollard, American Brass Co., Ansonia, Conn.
Dec. 10—Cast Iron Developments..... A. M. Ondreyco
Dec. 18—Christmas Party.
Stainless Steel.....Sound Movie
Jan. 21—Welding and Weld Testing..J. C. Hodge

NEW JERSEY CHAPTER
Secretary—J. L. Auer, Crocker-Wheeler Electric Mfg. Co., East Orange, N. J.
Dec. 14—Dinner and Smoker.
Jan. 11—Physical Testing.....R. L. Templin

NEW YORK CHAPTER
Secretary—T. N. Holden, 1219 Glenwood Rd., Brooklyn, N. Y.
Dec. 21—Damping.....G. R. Brophy
Jan. 18—Copper and Brass.....R. A. Wilkins

NORTHWEST CHAPTER
Secretary—Alexis Caswell, Manufacturers' Association of Minneapolis, Minneapolis, Minn.
Dec. 8—Die Castings.....D. L. Colwell
Jan. 12—National Officers' Night.

NOTRE DAME CHAPTER
Secretary—Walter C. Troy, University of Notre Dame, Notre Dame, Inc.

ONTARIO CHAPTER
Secretary—L. F. Fitzpatrick, 321 Weston Rd., S., Toronto.
Dec. 4—Hardness Testing.....V. E. Lysaght
Jan. 8—Problems in Bronze.....H. J. Roast

PENN STATE GROUP
Secretary—D. F. McFarland, Penn State College, State College, Pa.

PEORIA CHAPTER
Secretary—L. E. Roark, Box 765, Peoria, Ill.
Dec. 14—Welding.....L. J. Larson
Jan. 11—Malleable Cast Iron...Enrique Touceda

PHILADELPHIA CHAPTER
Secretary—A. O. Schaefer, The Midvale Co.
Dec. 4—Furnace Atmospheres.....H. W. Gillett
Jan. 8—Molybdenum High Speed Steel..... A. J. Herzig
Jan. 29—Metallurgy of Welding..... Everett Chapman
Dec. 11—Annual Smoker.

PITTSBURGH CHAPTER
Secretary—H. L. Walker, P.O. Box 6621, North Side Station.
Dec. 10—Stag Party.
Jan. 14—Raw Materials and Pig Iron Production.....Ralph H. Sweetser

RHODE ISLAND CHAPTER
Secretary—Carl G. Peterson, Providence Gas Co., Providence, R. I.

ROCHESTER CHAPTER
Secretary—Irving C. Matthews, Eastman Kodak Co.
Dec. 14—Heat and Corrosion Resistant Castings.....J. D. Corfield
Jan. 11—Welded Structures....Everett Chapman

ROCKFORD CHAPTER
Secretary—Alan C. Mattison, Mattison Machine Works.

SAGINAW VALLEY GROUP
Secretary—C. M. Campbell, Chevrolet Parts Mfg. Co.
Jan. 19—Automotive Cast Iron.....H. S. Austin

SCHENECTADY CHAPTER
Secretary—Scott Mackay, Rensselaer Polytechnic Institute, Troy, N. Y.

SOUTHERN TIER CHAPTER
Secretary—K. J. Mackenzie, International Business Machines Corp., Endicott, N. Y.

SPRINGFIELD CHAPTER
Secretary—Albert W. Morris, Moore Drop Forging Co., Springfield, Mass.

ST. LOUIS CHAPTER
Secretary—H. L. Dunn, E. F. Houghton & Co.
Dec. 18—Non-Ferrous Metals.
Jan. 15—Atmospheres and Heat Treatment .....R. J. Cowan

SYRACUSE CHAPTER
Secretary—R. S. Aller, Halcomb Steel Co.

TRI-CITY CHAPTER
Secretary—Robert H. Lind, Peoples Light Co., Davenport, Iowa.
Dec. 8—Forging.....E. O. Dixon
Jan. 12—Party Night.

WASHINGTON CHAPTER
Secretary—George A. Ellinger, National Bureau of Standards.
Dec. 14—Stainless Steels.....C. E. MacQuigg
Jan. 11—Malleable Iron.....H. A. Schwartz

WORCESTER CHAPTER
Secretary—Carl G. Johnson, Worcester Polytechnic Institute.
Dec. 3—Stainless Steels.
Jan. —Annual Wire Meeting.

YORK CHAPTER
Secretary—Charles M. Strickler, General Machine Works.
Dec. 9—Steel Failures .....Howard Stagg
Jan. 13—Grain Size.....H. W. McQuaid

GearingAdvancementRapid

New Gears Are Light-Weight, Strong, Silent, Says Davis

Tri-City Chapter—The advancement in gearing in the past few years has outmoded all former products, said E. F. Davis, metallurgist, Warner Gear Division of Borg-Warner, addressing a dinner meeting on Oct. 13 at the Rock Island Arsenal Auditorium. About 75 were in attendance.

Mr. Davis discussed gearing from all angles, including the selection of steels, heat treatment, and types of furnaces most suitable for heat treating gears. New steels, more accurate machining, and careful heat treatment, according to Mr. Davis, are responsible for the present light-weight, strong, and silent gearing with which automobiles are equipped.

Dean F. M. Dawson, who has recently taken over the duties as dean of the College of Engineering at the State University of Iowa, was introduced to the group. He gave a brief, interesting talk on the relationship of educational institutions with industry, stating that any cooperative activities are of mutual benefit.

Entire Machining Field Is Covered In Talk by Ernst

James Weir of Aluminum Co. Is Coffee Talker at Record Cleveland Meeting

By Hugh E. Brown

Cleveland Chapter—The meeting of Nov. 2nd was held at the Cleveland Club with the largest attendance the Chapter has ever had. A total of 448 were registered at the door and the two speakers of the evening succeeded in entertaining this large crowd until about 11:30.

Coffee talker was James Weir of the Aluminum Co. of America. He discussed the trends in the present-day automobile, covering the important points that have to do with design and operation of the new models now coming on the market.

The report of the Membership Committee headed by Walter O. Kurtz was of great interest, inasmuch as the Cleveland Chapter has now reached an all time high with some 703 members.

The technical talk was given by Hans Ernst, research director, Cincinnati Milling Machine and Cincinnati Grinders, Inc. He was introduced by Technical Chairman Don Gurney and talked on the subject of researches in the process of cutting metal.

Mr. Ernst has a fund of information regarding machining in general and his very clear and concise explanation of just what goes on at the point of a tool was not only interesting but very instructive. He covered the theory and showed how the metal flows, discussed the various types of chips, and, in fact, covered the entire field of machining in a very instructive talk.

The address was closed by the presentation of a movie film which actually showed how the metal compresses and ruptures as the tool progresses on its way in making a cut.

Rochester Metal Course Will Extend Over 3 Years

A three-year course in the "Elements of Metallurgy" is being offered by the Rochester Chapter of the Society free to all members.

Classes are being held on Monday evenings from 7:00 to 8:40 p. m. in Room 208, Engineering Building, University of Rochester. Prof. W. J. Conley is the instructor.

During the first year the course deals with fundamentals only, covering forces, stresses, internal structure of metals and alloys, mechanical tests, production and refining of metals, and metallography. During the second and third years a study of the different types of ferrous and non-ferrous alloys, including their selection, heat treatment, fabrication, and uses, will be made.

N. Y. Chapter Members Give Preview of Congress Papers

By F. H. Clark

New York Chapter—A preview of papers to be presented at the National Metal Congress in Cleveland was given at the first fall meeting on Oct. 5. It was held in the hall of the Metal Products Exhibit at Rockefeller Center, and dinner was served in the Mayan Restaurant.

The following members each discussed a group of papers: J. W. Sands and O. W. McMullan of International Nickel Co., Dr. R. M. Bozorth of the Bell Telephone Laboratories, Dr. R. F. Miller of the U. S. Steel Corp. Laboratories and Dr. A. B. Kinzel of the Union Carbide and Carbon Research Laboratories.

A.S.M. Booth at National Metal Exposition

This attractive booth in the Public Auditorium was manned by members of the Cleveland Chapter during the Metal Show in Cleveland Oct. 19 to 23.

Two Lecture Courses and Conference Meetings Are On Educational Program

"Overcoming Service Failures in Steels" is the title of the fall lecture course of the Cleveland Chapter, which will be presented on four consecutive Monday evenings starting Nov. 9 in the Bingham Mechanical Bldg., Case School of Applied Science.

The first lecture, by Norman I. Stotz of Universal-Cyclops Steel Corp., covered service failures in tool and die steels. Robert Sergeson, Republic Steel Corp., then gave an analysis of fabrication of S.A.E. steel, and E. J. Hergenroether of International Nickel Co. will follow with a discussion of alloy steels. The last lecture, on steels and welds at high temperatures, will be given by J. C. Hodge of Babcock & Wilcox Co.

Three conference meetings are planned for December, January, and February on furnace atmospheres, flame cutting and flame hardening, and spectroscopy.

These will be followed by a spring educational course on "Fundamentals of Ferrous Metallurgy" to be presented by Dr. A. A. Bates of Case School of Applied Science.

Host at Welding Clinic

Robert W. Bartram, member of the Montreal Chapter, A.S.M., was host to a gathering of over 800 men who attended the Welding Clinic held at the plant of the Dominion Bridge Co., Lachine, on Oct. 9 and 10.

Demonstrations of joining operations on non-ferrous metals were held at each session, and those in attendance were given an opportunity of doing joining operations under the supervision of the demonstrators.

The sponsors of the Clinic were: Aluminum Co. of Canada, Ltd., Anaconda American Brass, Ltd., and International Nickel Co. of Canada, Ltd.

Copper and Brass Alloys Discussed at New Jersey

By J. L. Auer

New Jersey Chapter—Dr. D. K. Crampton's paper on "Copper and Brass Alloys," presented at the Oct. 12 meeting, was one which will be remembered by all who had the pleasure of hearing it.

His thorough knowledge of the subject and his gentle personality made his talk, while theoretical, understandable to the many practical men in attendance, as was evidenced by the tremendous interest in the questions put to him following his presentation of the paper.

Dr. Crampton is director of research for Chase Brass and Copper Co., Waterbury, Conn.

Ball Game Features Picnic

Black Eye and Skid Into Creek Are Only Errors at York Outing

By D. Flinchbaugh

York Chapter—The annual stag picnic, July 11, was a big success—everyone ate, drank, and enjoyed himself to capacity.

Harrisburg's ball team nosed out York by a score of 2 to 0 with only two errors, both by York. The first came early in the game when Harry Hoehler made a dash after a fly ball that ended with a 20-ft. skid into the creek. The second was Horace Hoch's black eye which was not received in a controversy with referee Tom Moore of Philadelphia, as rumored, but from a foul tip.

Harrisburg then took over the Lancaster team for a game which ended with everyone licked.

It was said the height of Frank "Scotty" Allen's career was realized when he was handing them over the bar with only a ¼-in. head.

A beautiful day, exceptional fellowship, and a wonderful Chapter together provided a marvelous time.

Stainless Defined On Basis of Film Forming Capacity

MacQuigg Attributes Failures to Changes in Environment or Misapplication of Steel

By Arthur L. Sanford

Columbus Chapter—At its first technical session of the year on October 6, the chapter was host to C. E. MacQuigg, Union Carbide and Carbon Corp. However, it was the genial Mr. MacQuigg who entertained with his discussion of "The Properties and Uses of Stainless Steels."

The meeting was held in the auditorium of Battelle Memorial Institute and the attendance was about 75.

Mr. MacQuigg outlined the film theory, to which he ascribed the corrosion resistance of steels of the stainless type. He defined stainless or "corrosion resistant" steels as steels capable of building up and maintaining an impenetrable basic oxide or hydroxide film on the surface under the environment encountered. The problem of defining corrosion resistant steels on the basis of the composition or the environment to which the steel is resistant is very difficult and not entirely satisfactory in either case.

Mr. MacQuigg stated that he believed most failures of stainless steels are due to changes in environment or misapplication of the particular steel rather than to faulty steel, particularly if the material was purchased from a reputable manufacturer.

The effects of additions of Ni, Mo, Si, Cu, Ti, V, W, and Co on the properties of high chromium steels were outlined. Aluminum and titanium are particularly helpful in increasing the high temperature oxidation resistance, while titanium, columbium, and molybdenum are aids in combatting intergranular corrosion.

The effects of these addition elements on other properties, such as creep and resistance to corrosion by acids, alkalies, and foodstuffs, and the tendencies of these elements to form ferrite, austenite, or carbides were discussed.

Dr. H. W. Gillett introduced the speaker and led the lively discussion which followed his presentation.

Mr. MacQuigg discussed the same subject at the October meetings of the Dayton and Cincinnati Chapters.

Free Literature — Mail Coupon Below

Nitri-Cast-Iron
Nitri-Cast-Iron, what it is, its properties, and where and how it can be used to advantage are told in a very attractively printed and illustrated booklet by The Forging and Casting Corp., Ferndale, Mich. Many other applications of this new material have been developed in addition to its original use for automotive cylinder and pump liners. Bulletin R-160.

Bend Tester
The Naumann-Schopper bend tester was originally developed for use on cardboard and wood veneer, but has an extremely valuable application in the testing of tinplate. The apparatus is described by Testing Machines, Inc. Bulletin R-161.

Electric Salt Baths
Literature is available from Bellis Heat Treating Co. describing electrically heated bath furnaces which are economical to operate and have a wide range of applications in hardening, annealing, and heat treatment of high speed steel, stainless steel, nickel, aluminum, copper and bronze, etc. Bulletin Ny-48.

Machining Stainless
Don't let machining problems keep you from using stainless steel. A booklet by U. S. Steel Corp. contains full information on two types of stainless steels which can be easily handled on automatic screw machines for quantity production. Bulletin Ny-79.

Welding Technique
A new arc welder has been designed by Lincoln Electric Co. in which the heat of the welding arc can be varied as to type as well as to intensity. A book giving full details of this new dual continuous control is ready for distribution. Bulletin Ny-10.

Easy Flow Brazing
Handy & Harman's Easy-Flo Brazing Alloy, a recent development, is recommended for joining stainless steel and iron, Monel metal, Inconel, Everdur and other ferrous and non-ferrous metals. Briefly described in Bulletin Ny-126.

Optimatic System
The Brown Optimatic System is a self-balancing automatic optical pyrometer which records temperature readings with the speed of light — the human eye is eliminated. It is described by Brown Instrument Co. in Bulletin Ny-3.

New Enduro Book
The fruit of a tremendous amount of research on the part of Republic Steel Corp.'s metallurgists is contained in a handsome booklet giving general applications and extensive tabular matter on physical and chemical properties of 13 types of Enduro stainless steels. Bulletin Ny-8.

Vertical Carburizer
The Hevi Duty electric vertical retort carburizer is particularly applicable to intricate parts and selective carburization, where distortion must be held to a minimum. It is described in Bulletin Mya-44.

Hy-Speed Case
A new combination of salts has been devised by A. F. Holden Co. for the heat treatment of high speed steels, which is said to increase tool life from two to ten times. Details are given in a four-page folder. Bulletin Ny-55.

Trial Degreaser Offer
A four-page folder issued by Detroit Rex Products Co. illustrates three of their standard Detrex Degreasers which are offered for trial in plants desiring to increase the speed and reduce the cost of their cleaning operations. Bulletin Ny-111.

High Speed Furnace
American Gas Furnace Co.'s improved high speed furnace provides atmosphere control, combustion control, speed, economy, and clean, hard work. Clear and complete description is given in Bulletin Ny-11.

Blowers
A folder devoted to the application of rotary positive blowers in foundry cupola service, issued by Roots-Connersville Blower Corp., discusses in detail the structural and operating features of these blowers. Bulletin Jyc-131.

Uses of Monel
"Five minutes with Monel" is a small booklet containing much practical and technical information on this useful metal. It is accompanied by another distinctive publication, quoting officials of several large manufacturers as to why they selected Monel metal for a certain application. International Nickel Co. Bulletin Ny-45.

Centricast Boxes
The story of centrifugally cast carburizing and annealing boxes—their reason for being, method of production, properties, and advantages—is made extremely readable in a folder by Michigan Steel Casting Co. Bulletin Jya-84.

Pure Metals
Pure, carbide-free metals are described and applications suggested in a pamphlet published by Metal & Thermit Corp., who make pure tungsten, chromium and manganese in addition to the ferro-alloys. Bulletin Mya-64.

Welding Copper
Procedure for welding with the high voltage carbon arc is described and illustrated by American Brass Co. Physical test data on welded specimens and a brief description of 17 Anaconda welding rods are included. Bulletin Jya-89.

Electric Heat
The certainty of results obtained with electric heat is economically available in automatically controlled electric furnaces. Hoskins Mfg. Co. has a catalog stressing the advantages and low-cost maintenance of their line of furnaces. Bulletin Jya-24.

Abrasion Resisting
Striking indeed is the yellow-covered publication by Carnegie-Illinois Steel Corp. giving the history of AR steel, a low-priced abrasion resisting steel, and showing actual results in service as compared to ordinary mild steel. Bulletin Mya-85.

Cutting Steel
Recommended practices for gas cutting of structural steel are given in a concise and authoritative form by The Linde Air Products Co. Qualification tests for good workmanship from the standpoint of accuracy and smoothness of cuts are also described. Bulletin Dc-63.

Melting Furnaces
Pittsburgh Lectromelt Furnace Corp. offers a folder describing its line of new top-charging melting and refining furnaces. Economies of top-charging are analyzed and much information on operation and construction is given. Capacities range from 50 lb. to 50 tons. Bulletin Jr-18.

Annealing
A technical article on annealing in controlled atmospheres has been published by Continental Industrial Engineers, Inc., in a handy little booklet. Diagrams and photographs clearly illustrate the bright annealing furnace described. Bulletin Ny-154.

Foundry Metallograph
Today's engineering cast irons are structure-controlled in the foundry. The E. Leitz simplified micro-metallograph MM-2 is particularly adapted to foundry applications. Bulletin Fy-47.

Aluminum Finishes
Good printing, good paper, spiral binding and an attractive presentation add interest to the valuable technical information on "Finishes for Aluminum" contained in Aluminum Co. of America's new booklet. Bulletin Oy-54.

Lubrication Research
An issue of E. F. Houghton & Co.'s new publication, "Research Illustrated," is devoted to lubrication. It is a fine pictorial presentation of the practical problems of lubricating intricate, high speed, modern machinery. Bulletin Oy-38.

New-Series Recorders
Foxboro's new bulletin describes in detail the extra, compensating slide-wire—a feature found only in the Foxboro potentiometer recording pyrometers for industrial temperatures. All types are listed and illustrated in this booklet. Bulletin Myb-21.

Luxite
"Luxitize your cupola," says Alpha-Lux Co., and gives complete directions for lining cupolas, brass furnaces, crucible furnaces, ladles, and patching with this material. Bulletin Myb-120.

Heat Treating Line
An attractive catalog of heat treating products is published by Park Chemical Co. It starts out with a very useful diagrammatic thermometer showing the temperatures and ranges for the various heat treating, melting, and other processes requiring heat. Bulletin Oy-141.

Camera-Microscope
A highly efficient and up-to-date apparatus that is an ingenious combination of several instruments into one universal camera-microscope is described by Pfaltz & Bauer, Inc. in a handsomely printed booklet containing some intriguing photomicrographs. Bulletin Oy-142.

The Review,
7016 Euclid Ave., Cleveland

Please have sent to me without charge or obligation the following literature described in the November issue. Please order by number only. It is important to write in your company or business connection when you return this coupon.

Name ..... Title .....

Company .....

Company Address .....

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Testing Catalog
A loose-leaf binder provides a handy reference catalog of testing machines made by Steel City Testing Laboratories. Universal hydraulic machines, Brinell testers, Bend, Impact, Tensile, and Ductility testers are some of the products. Bulletin Oy-140.

Castable Refractory
Properties, method of use, and applications of "Cast-Refract," a time and labor-saving castable refractory made by the Quigley Co., are given in Bulletin Oy-139.

K & S Pyrometer
How it works and why are told in a folder by Industrial Pyrometer Co. describing the K & S optical radiation pyrometer, a simple, low cost, accurate and durable instrument. Bulletin Oy-137.

Port Valves
Diagrams and descriptive matter show the operation of adjustable port valves made by North American Mfg. Co. that are particularly suitable for mediums whose rate of flow is not constant. Bulletin Oy-138.

Electric Control
A complete new control system for regulating input in proportion to demand is described in "Micromax Electric Control," an illustrated eight-page catalog issued by Leeds & Northrup Co. Bulletin Oy-46.

Gas Carburizing
Surface Combustion Corp. shows how five years of use have proven the Eutectrol process of continuous gas carburizing to give better control of case depth and character, along with large savings in cost. Bulletin Oy-51.

Alloy Castings
Michiana Products Corp. has published a new book describing Michiana corrosion resistant and stainless steel alloys. Generously illustrated, it suggests many savings for the use of these alloys. Bulletin Oy-81.

Salt Bath
"Heating from the inside out" is what makes the Ajax-Hultgren salt bath furnace practical. Ajax Electric Co. explains this new operating principle in an interesting folder. Bulletin Oy-43.

Nichrome
"Nichrome" nickel-chromium resistance alloy is not the only product made by Driver-Harris Co. A new 68-page catalog gives complete data for this well-known material as well as a wide variety of other alloys. Bulletin Oy-19.

Kanthal
Kanthal, an alloy for electric heat developed in Sweden, is now being marketed in the United States by C. O. Jelliff Mfg. Corp. A new catalog gives full information on properties, forms available and fabrication. Bulletin Oy-78.

Insulation
The 1936 edition of the Johns-Manville Industrial Products Catalog is a 60-page book, profusely illustrated, containing a wealth of information and recommendations on insulating materials and a wide variety of related products. Bulletin Oy-100.

Manganese Steel
A whole bookful of useful technical information is packed into a folder by American Manganese Steel Co. entitled "The Story of Manganese Steel." Bulletin Oy-9.

Stainless Tubing
A folder full of helpful technical data on the properties and use of welded stainless steel tubing, a product finding many new applications, is offered by Carpenter Steel Co. Bulletin Oy-12.

Pyrometer Supplies
Claud S. Gordon Co. offers a large catalog giving prices and descriptions of the great variety of pyrometers and pyrometer accessories carried in stock for quick delivery. Bulletin Ob-53.

Rolling Mill Bearings
Timken Roller Bearing Co.'s 64-page, 8½ by 11 in. booklet entitled "The Answer to Rolling Mill Bearing Problems" will appeal strongly to mill designers and operators. It is well printed and liberally illustrated with photographs and diagrams. Bulletin Oy-71.

Pyrometer Set
Filling a long-felt want in certain industries, Pyrometer Instrument Co. has developed a new set of combination surface and needle pyrometers. The indicator and four attachments are described in Bulletin Oy-37.

Useful Wall Chart
Wyckoff Drawn Steel Co. offers a big new wall chart full of such useful data as comparative machinability of S.A.E. steels, tables for selecting steels according to machinability, cold forming properties, carburizing and hardening ability. Bulletin Ox-99.

Electric Brazing
If your product has small parts which are now being torch-brazed, riveted, pinned, or machined from solid stock, you should be interested in the General Electric booklet on electric furnace brazing. Their furnace is continuous and uses an atmosphere of processed city gas. Bulletin Fy-60.

Oils, Compounds
J. W. Kelley Co.'s line of Beacon Brand products—industrial oils, carburizing compounds, heat treating salts, greases, and cleaners—is described in a little booklet which also tells about the company's experience, equipment, and facilities for quick service. Bulletin Ox-102.

Ferro-Alloys
An interesting folder by Electro Metallurgical Co. tells all about their ferro-alloys and their special service to users which will help them to operate their furnaces and make alloy additions under the proper conditions. Bulletin Jya-16.

Chapmanizing
Chapmanizing, the new method of surface hardening steel with nitrogen, is described in a very attractive booklet of Chapman Valve Mfg. Co. Information is given out on the method itself and on its metallurgical advantages. Bulletin Ob-80.

Mortars and Plastics
A new eight-page, fully illustrated booklet presenting the general characteristics as well as specific properties of each of the five B&W mortars and plastics is announced by Babcock & Wilcox Co. Bulletin Ay-75.

Wide-Strip Pyrometer
Full details of the many important features incorporated in the Bristol Co.'s new wide-strip potentiometer pyrometer with simplified measuring, self-balancing, and self-standardizing mechanism are contained in Bulletin Jya-87.

Properties of Stainless
Ludlum Steel Co. describes the several analyses of Silcrome corrosion and heat resisting steels in a new data sheet. Physical properties are given for each type, as well as a summary of general characteristics. Bulletin De-94.

Laboratory Furnace
The Sentry Co. describes a high temperature tube combustion furnace. It permits operating temperatures up to 2500° F., thus offering greater speed and precision for combustion analysis or other laboratory procedures. Bulletin Myb-114.

Sheffield Steels
Wm. Jessop & Sons, Inc., have a leaflet which tells why a special anneal and a proper balancing of carbon, manganese and tungsten combine to make Sheffield Superior oil hardening steel non-distorting and easily machinable. Bulletin Jn-61.

Prevention of Rust
"Proof of Results" is the apt title of a new booklet issued by Dearborn Chemical Co. Dozens of photographs, supported by an interesting text, show how No-Ox-Id keeps steel from rusting. Bulletin Mr-36.

Gear Steels
Those who have gear problems of any type can get valuable assistance from Endicott Forging & Mfg. Co., specialists in the manufacture of gear blanks. They carry in stock a large assortment of standard gear analyses and will manufacture to customer's blueprints and specifications. Bulletin Ox-65.

Swedish Tool Steels
"Pure-Ore" is a high carbon, high chromium Swedish steel especially valuable for dies in high production work. It is described in a folder by Kloster Steel Co., which is accompanied by a second folder describing "Swed-Oil," a non-shrinking, oil hardening tool steel which assures safety in hardening. Bulletin Ox-72.

Aluminum Castings
Arthur Seligman & Co.'s booklet on "Aluminum Alloy Castings" contains the latest casting specifications of the Society of Automotive Engineers and the American Society for Testing Materials in condensed form. Bulletin Ox-101.

Alloy Steels
Why alloy steels are best for heavy equipment and other exacting applications is discussed in a folder by Bliss & Laughlin, Inc. A partial list of the more common grades gives machine ratings and turning speeds. Bulletin Jyb-42.

Grinding Lubrication
A handy outline for the selection of grinding wheels is one of the useful features of a booklet full of facts about grinding solutions. D. A. Stuart & Co. Bulletin Mya-118.

Creep Tests
Calorizing Co. offers a report presenting long time high temperature creep values on chromium-nickel alloys. This bulletin contains many pertinent data and recommendations as to safe working stresses for heat enduring castings at temperatures from 1400 to 2000° F. Bulletin Mr-26.

Titanium in Steel
The use of ferro-carbon-titanium in steel is thoroughly described in a booklet of Titanium Alloy Mfg. Co. Titanium's application in forgings, castings, rails, sheets and plates is interestingly explained. Bulletin M-90.

Mo-Cr-Ni Forgings
A real text is presented by A. Finkl & Sons Co. on heat treated molybdenum-chromium-nickel steel forgings for heavy machinery. The illustrations and physical property tables and curves speak for themselves. Bulletin Mya-23.

X-Rays in Industry
General Electric X-Ray Co. has available a profusely illustrated brochure which gives the complete story of the industrial applications of X-Rays, the modern inspection tool. Bulletin Ma-6.

Stainless Service
Joseph T. Ryerson & Son, Inc., has ten plants handling Allegheny stainless steel and service. A beautiful booklet describing and illustrating in color the products and services available is ready for distribution. Bulletin Jyb-106.

MoTung
An indexed booklet prepared by Universal Steel Co. tells about the new molybdenum-tungsten high speed steel, giving its history, information on working and treatment, surface protection, high heat temperatures, drawing temperatures, effect of treatment, and microstructures. Bulletin Jyb-128.

Get These Useful Booklets Free

Heat Resisting Alloy
Ohio Steel Foundry Co. offers an elaborate booklet covering the production of Fahrite heat resisting alloy castings, illustrating their many uses and giving comprehensive metallurgical data. Bulletin Ob-40.

Carburizing Steel
High strength and ductility, forgeability, and machinability, combined with superior case carburizing properties permit the attainment of maximum production with minimum cost. Such properties are obtainable in Jones & Laughlin's Jalcase steel. Bulletin Mx-50.

Casting Problems
Unusual casting problems that were solved by the use of National Alloy Steel Co.'s oxidation, corrosion, and abrasion resisting castings are shown in a clever pictorial manner in an attractive folder. Bulletin Ox-104.

Laboratory Furnaces
Tiny induction furnaces which will melt ½ lb. of steel in 8 min. or 4 lb. of copper in 35 min. find a wide variety of uses in many kinds of laboratories. Ajax Electrothermic Corp. tells all about these small laboratory furnaces and the 3-kw. converter used with them in Bulletin Ox-41.

Conditioned Atmosphere
W. S. Rockwell Co. has issued a folder on their conveyor, belt-type furnace with conditioned atmosphere for handling most metals in bright and scaleless hardening. Advantages are clearly shown. Bulletin Ob-34.

Torsion Impact
Baldwin-Southwark Corp. makes available a folder of technical information on their Carpenter torsion impact testing machine, showing how to operate it and indicating the types of investigation the machine will serve. Bulletin Ob-67.

The Laboratory
The latest issue of Fisher Scientific Co.'s interesting little magazine, "The Laboratory," containing articles of historical and practical value, may be had by sending for Bulletin R-133.

Boron Carbide
An extremely interesting little booklet describes "the hardest material ever produced by man for commercial use." This is boron carbide, and its manufacture, properties, and uses as an abrasive and as a wear resisting material are told by Norton Co. Bulletin Dc-88.

High Speed Hardening Furnaces
P. D. M. high speed hardening furnaces are described in two bulletins by The Philadelphia Drying Machine Co.—one devoted to oil-fired and one to gas-fired furnaces, both made in single and twin chamber models. Details of construction, design features and tables of sizes and capacities are included. Bulletin Oy-150.

Electrotinning
E. I. du Pont de Nemours & Co.'s new manual on the sodium stannate-acetate electrotinning process is particularly timely. Electrodeposition, at first considered useful only for tin coating of recessed and irregularly shaped objects, is now being considered favorably for all types of work. Bulletin Ox-29.

Mo-W High Speed
In a four-page folder, The Cleveland Twist Drill Co. announces the development of a new steel for high speed metal-cutting tools. Mo-Max steels are particularly suited to tools subjected to severe conditions of heat and abrasion. Physical characteristics and heat treating temperatures are discussed. Bulletin Ox-103.

Forging Control
The rigid metallurgical control exercised in the forge shops of National Forge and Ordnance Co. is illustrated by picture and text in an interesting folder. Bulletin Sy-136.

Metalliput
A new inverted universal microscope designated the "Metalliput" is described in a leaflet by Carl Zeiss, Inc. It can be used for bright and darkfield metallography and macrography and is convertible for use with transmitted light. Bulletin Sy-28.

Specialized Tester
The Rockwell superficial hardness tester is a specialized instrument for use where the indentation into the work must be kept shallow or of small area, yet sensitivity preserved. A supplement to Wilson Mechanical Instrument Co.'s catalog on the regular Rockwell tester tells all about it. Bulletin Sy-22.

Lower Production Costs
The use of cold drawing may often eliminate costly production methods. Union Drawn Steel Co. has a folder illustrating exact size some of the thousands of special sections they produce, finished in bars ready to be cut to proper lengths. Bulletin Sy-83.

Stainless Data Book
All users of stainless and heat resisting alloys should find invaluable the information contained in a booklet published by Maurath, Inc., giving complete analyses of the alloys produced by the different manufacturers, along with the proper electrodes for welding each of them. Bulletin Jyb-125.

New Recorder
C. J. Tagliabue Mfg. Co. announces for the first time in a new edition of their pyrometer catalog a new two- and three-position recorder-controller. The complete Tag line of indicating, recording, and controlling pyrometers, which utilize a beam of light, a mirror galvanometer and a phototube, is also described. Bulletin Ay-62.

Stainless Steel Uses
The wide range of applications of Allegheny Metal, best known of Allegheny Steel Co.'s corrosion and heat resistant steels, is pictorially covered in a new and interesting booklet. Bulletin Ob-92.

Globar Elements
Globar electrical heating units and a variety of accessories for their operation have been catalogued by Globar Division of Carborundum Co Bulletin Oy-25.

Metal Analyst
Volume 1, 1936, suggests application of newer methods to the daily routine for the metallurgist. Adolph I. Buehler describes Bakelite specimen mountings, new type cutting machine, low cost grinders and polishers and an offer of scratch free polishing cloth. Bulletin Ay-135.

Vanadium Facts
Revived after nearly 20 years is the house organ of Vanadium Corp. of America, "Vanadium Facts." This paper shows considerable thought and care in its preparation and contains valuable and interesting information on vanadium steels. Bulletin Ox-27.

Forging Machines
The Acme Machinery Co. has published an interesting bulletin on a distinctly new forging machine—the Model 35 Acme. This booklet illustrates and fully describes the new Acme Eccentric Header Slide which eliminates entirely the conventional Pitman construction. Bulletin Ox-39.

Drop Forgings
An attractive and comprehensive book on drop forgings has just been published by the Drop Forging Association. The book deals with the characteristics, qualities and uses of drop forgings and is a valuable addition to the library of any one interested in this subject. Bulletin Aya-123.

Air-Clutch Forging
Two bulletins are offered by Ajax Mfg. Co. One tells about their air-clutch forging machines in 2 to 7-in. sizes, made according to the most advanced design. The second is concerned with the Ajax-Hogue wire drawer, an attachment for heading machines which presents new economies. Bulletin Ox-105.

Conveyor Furnaces
Continuous chain belt conveyor furnaces handle miscellaneous parts without pans or trays—they are efficient, uniform, and flexible in operation. Improved furnaces of this type are described by Electric Furnace Co. Bulletin Ayx-30.

No-Contact Control
A book which should be in the hands of every man interested in temperature reading and control is the Data Book published by Wheelco Instruments Co., which describes a line of indicating and controlling pyrometers with Wheelco no-contact system of control. Bulletin Dx-110.

Bench Type Furnace
American Electric Furnace Co. has a new bulletin describing their new bench-type electric furnace for low cost, high speed hardening. It can be used for all types of high speed steel. Bulletin Jya-2.

Silico-Manganese Steel
Silico-manganese steel for heavy springs is the subject of Bethlehem Steel Co.'s new folder giving its properties and recommendations for heat treatment. Bulletin Jyx-76.

Moly Cast Iron
The use of molybdenum in foundry practice, both on steel and cast iron, is described in a handsome booklet by Climax Molybdenum Co., which presents accurate technical information in a striking and modern manner. Bulletin Jyc-4.

Spoilage Insurance
C. I. Hayes, Inc., has compiled a record of reports from over 300 users of their "Certain Curtain" controlled atmosphere furnaces showing how these furnaces have cut down spoilage in the heat treatment of tools. Bulletin Sx-15.

Blast Cleaning
So many changes have taken place in blast cleaning and dust collecting equipment in the past three years that Pangborn Corporation's "quick reference" catalog of condensed information will be invaluable to all those interested in this subject. Bulletin Jyc-68.

Heat Treating Manual
A folder of Chicago Flexible Shaft Co. contains conveniently arranged information on heat treating equipment for schools, laboratories and shops, and also illustrates the several types of Stewart industrial furnaces. Bulletin Ar-49.

Recuperators
Results obtained with Carborundum Company's recuperators using Carbofrax tubes are fuel savings, closer temperature control, faster heating, and improved furnace atmosphere. Complete engineering data are given in Bulletin Fx-57.

Micro Equipment
A 38-page illustrated catalog describes photomicrographic equipment made by Bausch & Lomb Optical Co. The various types of microscopes, cameras and accessories are fully covered, with price list and specifications included. Bulletin Sy-35.

Steel Handbook
A handbook has been prepared by Heppenstall Co. covering the effects of alloying elements and the physical properties of steel in forged sections. Such valuable data as heat treating definitions, McQuaid-Ehn grain size classification, hardness conversion tables, and physical property tables are included. Bulletin Jyb-122.

Newer Tool Steels
Vulcan Crucible Steel Co. has a complete and attractive catalog listing their full line of tool steels including many special types to meet the modern trends in industry. Bulletin Jyb-127.

Combustion Train
A highly efficient and practical combustion train for modern metallurgical laboratories is the Chevrolet Motors Type sold by E. H. Sargent & Co., dealers in laboratory supplies. It is described in Bulletin R-137.

Furnace Control
How the Lindberg Control functions in balancing the rate of heating of a furnace or oven with the varying heat requirements is told in an attractive new bulletin issued by Lindberg Engineering Co. Bulletin Myb-66.

Convected Air Furnace
A novel application of the principle of mechanical convection to transfer heat uniformly around and through parts being heat treated is provided by a patented rotary fan. This equipment is incorporated in the convected air tempering furnaces described by Despatch Oven Co. in Bulletin Myb-123.

Corrugated Ingots
The Gathmann Engineering Co. has published a new booklet called "Gathmann Ingot Molds—Their Purpose and Design." It illustrates various corrugated ingot contours designed to produce defect-free surface in steel ingots. Bulletin Aya-13.

Burners and Valves
Auxiliary equipment for industrial furnaces that will insure proper heat production and correct combustion, such as oil and gas burners, blowers, regulating and shut-off valves, is fully described in Mahr Mfg. Co.'s illustrated booklet. Bulletin Jyx-5.

Nickel-Copper Steels
Exceptional resistance to corrosion and abrasion, increased tensile strength, and higher ductility are the qualities claimed for Youngstown Sheet & Tube Co.'s new series of Yoloy steels. A summary of properties and notes on their characteristics are contained in Bulletin Ox-93.

Tool Steel Catalog
A new catalog lists and describes the complete line of tool steels manufactured by Columbia Tool Steel Co. Bulletin Mya-115.

Turbo Compressors
The new items in Spencer Turbine Co.'s bulletin are a new and smaller "Midget" turbo for individual mounting, a single-stage line which effects new economies, and the gas-tight turbos for acid and explosive gases. Bulletin Mx-70.

Heat Resisting Alloys
Authoritative information on alloy castings, especially the chromium-nickel and straight chromium alloys manufactured by General Alloys Co. to resist corrosion and high temperatures, is contained in Bulletin D-17.

Ni-Cr Castings
Compositions, properties, and uses of the high nickel-chromium castings made by The Electro Alloys Co. for heat, corrosion and abrasion resistance are concisely stated in a handy illustrated booklet. Bulletin Fx-32.

Creep Tests
Calorizing Co. offers a report presenting long time high temperature creep values on chromium-nickel alloys. This bulletin contains many pertinent data and recommendations as to safe working stresses for heat enduring castings at temperatures from 1400 to 2000° F. Bulletin Mr-26.

Sponge Iron
A Bureau of Mines report gives some interesting data on vibration damping capacity of steels made with Swedish sponge iron as raw material. Ekstrand & Tholand, Inc., has copies for distribution. Bulletin R-162.

Testing with Monotron
Shore Instrument & Mfg. Co. offers a new bulletin on Monotron hardness testing machines which function quickly and accurately under all conditions of practice. Bulletin Je-33.

Compressors
B. F. Sturtevant Co. has a line of centrifugal compressors designed particularly for industrial furnace applications. These are illustrated and described in Bulletin Myx-58.

Descaling
Complete facts on the Bullard-Dunn process for electro-chemical descaling of metals are available in concise blueprint form. Bullard-Dunn Process Division of The Bullard Company, Bridgeport, Conn. Bulletin Oy-143.

Stainless Casting
An attractive new piece of literature describing Cooper stainless castings (thin section) and other casting alloys has just been published by the Cooper Alloy Foundry Company, Elizabeth, N. J. Bulletin Oy-144.

Catalog Bronze
An attractive bulletin is available giving interesting details regarding Catalog Bronze. Scientific Alloys, Inc. circulates it. Bulletin Oy-146.

Tocco Process
This amazing new and extremely accurate method of heat treating is described in a new four-page leaflet, yours for the asking. Distributed by Ohio Crankshaft Co. Bulletin Oy-145.

Testing Machines
An extremely handsome, spiral-bound, segregated catalog tells all about the various hydraulic and screw power testing machines made by Tinius Olsen Testing Machine Co. Bulletin Oy-147.

Aerocase
A modern method for case hardening and heat treating steel in a liquid bath is provided by the use of Aerocase compounds, which have been in commercial use for more than six years. Their principal features are described by American Cyanamid and Chemical Corp. in an interesting booklet. Bulletin Oy-148.

Hard Facing
The Stoody Company house organ, "Fusion Facts," contains helpful information on all kinds of hard facing. A copy of it will be sent along with a recently published booklet describing the new line of Stoodite metals on request for Bulletin Oy-149.

Polishing Machine
A reprint of an article from the A.S.M. *Transactions* by O. E. Romig and J. C. Whetzel is supplemented by photographs, specifications, and other information on the Cincinnati Electrical Tool Co.'s new metallographic polishing machine. Bulletin Ox-97.

Tool Steel Talk Given by Stagg

Stresses Dependability Aimed At by Manufacturers

By J. W. McBean

Ontario Chapter enjoyed a visit from Howard Stagg, assistant manager of the Halcomb Steel Co. Division of the Crucible Steel Co. of America, at a meeting in Hamilton, Ont., on Friday, Nov. 6.

A dinner, at which the attendance taxed the utmost capacity of the dining room, was followed by two films, one showing the Schmeling-Louis fight and the second recalling the happy hours of the Chapter's annual Field Day.

Mr. Stagg introduced his subject, "The Making of Tool Steel," with a review of the history of iron and steel, concluding with a few remarks regarding modern methods of tool steel manufacture. In discussing the characteristics of modern tool steels, he stressed the importance of dependability, and pointed out that all tool steel manufacturers at the present time are working to insure that their products can be relied upon by those who purchase them.

Film Shows Manufacture

Following Mr. Stagg's talk, another film was shown, which served to illustrate some of the points mentioned in the latter part of his introductory address. This film gave a clear idea of modern methods of manufacture of tool steel by the arc-electric, the induction, and the crucible processes. Mr. Stagg's running comments on the film emphasized the most important points covered by it.

Unfortunately, the late hour at which the meeting concluded made it impossible for a prolonged discussion to take place. One or two questions, however, were asked and were dealt with ably by Mr. Stagg.

Chapter Expresses Sympathy

It is with regret that the Chapter reports the death of the wife of Mr. W. O. ("Bill") Oliver, a charter member and past chairman of the Ontario Chapter. The sympathy of the Society is extended to Mr. Oliver, superintendent of the Swansea plant, Steel Company of Canada, Toronto, in the recent sad passing of Mrs. Oliver.

Pittsburgh Chapter Shop Meetings Are Designed For Practical Members

"Shop Meetings" will again be presented by the Pittsburgh Chapter this season starting next January. Pittsburgh, with a membership of nearly 700, finds that a diversification of interests is necessary in order to serve all of its members equally.

These discussions are extremely practical in nature. They are supplemented by a lecture course of a more fundamental nature, and by the regular program of monthly meetings in which various special subjects are discussed.

The first discussion, on Jan. 28, will be devoted to forging and will be conducted by J. A. Succop of Heppenstall Co. Seamless steel pipe will be discussed in February by T. G. Stitt of Pittsburgh Steel Co., and A. M. Reeder, Jones & Laughlin Steel Corp., will talk on manufacture and properties of carbon steel rods and wire on March 25.

The April subject is welding from a practical viewpoint by J. C. Hodge of Babcock & Wilcox Co., and in May an open forum for questions and answers will be held.

Molybdenum Tool Steels Originated in Search for Tungsten Substitute in 18-4-1

Investigated for Emergency Use, New Composition Is Now Developed Commercially With Excellent Properties

By A. J. Dornblatt

Washington Chapter—How the search for a suitable high speed steel containing no tungsten, which was begun in 1917, finally culminated in the development of Mo-Max steel was described by J. V. Emmons of Cleveland Twist Drill Co. before the Chapter meeting on Oct. 12.

When it was found that small tungsten additions would control the rapid grain growth of the molybdenum steels and that this material showed even better cutting tests than former types of steel, it was decided to develop it as a commercial material rather than simply as a substitute for 18-4-1.

A long period of laboratory testing was followed by a year's try-out in commercial usage. According to Mr. Emmons, during this period the new steel was found to be as good or better than 18-4-1 on nine out of every ten jobs.

Because of this equality, plus the price differential which now amounts to about 13c per lb. in favor of the Mo-Max type of steel, and also the strategic importance of an essential raw material free from foreign control (about 90% of the world's molybdenum is produced in the United States), the active launching of the new type into industry on a production scale was begun.

A majority of the American tool steel manufacturers now offer these steels under various trade names, and it is estimated that this year's production will exceed 1000 tons.

A typical composition of the steel is 8 to 9.50% Mo, 1.25 to 2.00% W, 3.25 to 4.00% Cr, 0.75 to 1.50% V, and 0.64 to 0.84% C. It should be noted that, in general, the carbon should be about ten points higher than for the corresponding grade of 18-4-1. From 2 to 12% cobalt may be added to this specification.

Metallographically this steel is scarcely distinguishable from ordinary high speed steel correspondingly treated. Lower forging and hardening temperatures are recommended, and slightly superior forging and machining characteristics have been observed. Better toughness, as measured by the static torsional method, is also indicated. Hardness is slightly higher.

These high molybdenum steels do show a somewhat freer diffusion of carbon and will decarburize or carburize faster than 18-4-1 high speed. However, satisfactory methods for preventing decarburization, such as salt baths, carbon muffles, or borax film, are well known, and there need be no special difficulty on this account.

In regard to uses, Mr. Emmons stated that to date no application using the 18-4-1 type has been found where the Mo-Max steel is not at least equally suitable. The average of some 2800 drill tests showed a performance for Mo-Max about 18% better than for the 18-4-1 type.

Milwaukee Chapter Has Five Lectures in Course

Five weekly lectures comprise the Fourth Educational Course of the Milwaukee Chapter, running from Nov. 2 to Nov. 30.

The first, third and fifth lectures are concerned with the "Principles of Heat Treatment" and are presented by Dr. Marcus A. Grossmann, director of research, Carnegie-Illinois Steel Corp.

On Nov. 9, R. G. Guthrie, consulting engineer, spoke on "Heat Treating Furnaces and Atmosphere Control," and on Nov. 23 M. O. Withey, head of the Department of Mechanics, University of Wisconsin, will lecture on "Interpretation of Mechanical Test Data."

The lectures are being held in Room S-100, Science Building, Marquette University.

York Hears Two Talks At Waynesboro Meeting

By D. E. Flinchbaugh

York Chapter—A dinner and regular meeting of the Chapter were held on Oct. 14 at the Anthony Wayne Hotel in Waynesboro, Pa.

A. E. Crocket, manager, Bureau of Instruction, Jones & Laughlin Steel Co., gave an interesting address on "Basic Elements of Steel Making." Mr. Crocket's general talk was accompanied by motion pictures.

The members also enjoyed a talk by Henry Holzapfel of the Potomac-Edison Co., Hagerstown, Md. Mr. Holzapfel gave interesting statistics of the wealth of our country in ore deposits, but got sidetracked on the subject of social and ethical rights and the present Government administration.

The meeting was attended by 42 of the Chapter's members.

Harder Addresses St. Louis

130 Members Journey to Alton, Ill., For October Chapter Meeting

By C. R. Culling

Saint Louis Chapter on Oct. 16 made a pilgrimage to Alton, Ill., for a meeting at the Mineral Springs Hotel, out of courtesy to the Alton members.

The meeting was well attended by about 130 members and guests who heard a very fine talk given by Dr. O. E. Harder, assistant director of Battelle Memorial Institute.

Carl H. Morken, a former pupil of Dr. Harder's at the University of Minnesota, introduced him and the doctor proceeded with his talk on "The Present Status of Metallurgical Research" illustrated by some 75 slides.

The discourse was well received and Dr. Harder's genial personality won him many new friends as well as delighting a score of his old friends.

We would like to see our Alton brethren turn out for the Saint Louis meetings, in the same numbers as were present on this occasion.

New Plating Solution Marketed

The Alrose Chemical Co., Providence, R. I., creator of the Jetal Black Process for steel and iron, is now marketing a "white brass" plating solution under the trade name Wite-Brass.

This is claimed to be as white as silver, non-tarnishing, and extremely simple to control. The process is inexpensive to install and the cost of the chemicals is less than 20c per gallon of solution.

Wite-Brass can be plated over any metal surface and is suitable for all types of metal novelties, flatwear, reflectors and metal stampings.

Steever Talks to Fellow Members On Drop Forgings

Chicago Chapter—Adam M. Steever delivered a paper entitled "Hammer and Drop Forging" before a large meeting on Thursday, Sept. 10, at the Medinah Club.

Inasmuch as the speaker was talking on home ground (and incidentally, left his listeners convinced that it was not necessary for him to be away from home to be an expert) J. A. Succop of Heppenstall Co. was invited to Chicago to act as technical chairman. Because Mr. Steever needed no introduction to his audience, Mr. Succop confined his opening remarks to alleged reminiscences concerning his old friend Steve which brought many laughs from the audience and some embarrassment to Steve. Adam, of course, claims they were exaggerations.

Adam Steever's paper covered the history and development of modern hammer and drop forging up to present-day practices. Types of hammers and their applications were discussed.

The steps in drop forging a number of intricate shapes were fully described and illustrated by slides and the newer developments in forging practice were cited.

The attendance at this meeting was a tribute to the high esteem and reputation that Mr. Steever has earned by his broad experience in forging.

Mr. Steever has served on the Chicago Chapter Executive Committee for many years and as chairman in 1928-1929. In addition, he has been in almost constant service on various technical committees, and is now a member of the National Metals Handbook Committee.

In February of this year, Mr. Steever was appointed superintendent of Columbia Tool Steel Co., Chicago Heights, Ill.

43% of Nickel Produced Goes Into Materials for Corrosion Resistance Searle Points Out

Montreal Hears About Nickel Alloys for Corrosion Resistance Also Scientific Discussion of Corrosion Theory

By Gordon Sproule

Montreal Chapter held its first meeting of the season on Monday, Oct. 5, at the Windsor Hotel.

The attendance of 56 members at the informal dinner was raised to about 175 during the showing of amateur movies of a "Trip to the Yukon" by P. H. Desrosiers of Sorel Steel Foundries.

"Corrosion Resisting Nickel Alloys" was the subject of the evening's lecture, given by Harold E. Searle, manager of sales research, International Nickel Co.

Mr. Searle gave first a statistical survey of the uses of nickel, pointing out that over 43% of the metal goes into materials intended especially for corrosion resistance.

Monel, containing 67% nickel, 30% copper and 1% iron, is resistant to salt, sulphuric acid, caustic soda and many other corrosive substances. It is used in a supercentrifuge running at 50,000 r.p.m. separating lubricating oil from sulphuric acid used to refine the oil. At Boulder Dam it is used for permanent strength in the 32-ft. diameter valves. On account of its good condition after 27 years on the roof of Pennsylvania Station in New York, it is being used for other large roofing jobs.

K Monel for Strength

"K" monel, containing 66% nickel, 30% copper, and 2% aluminum, may be heat treated to a strength and hardness comparable to heat treated alloy steels used in airplane crankshafts.

"R" monel is "free-machining," although the toughness and corrosion resistance of regular monel have not been sacrificed to a serious extent.

Pure nickel is the best material for evaporators producing caustic soda which must be free from discoloration due to iron; such caustic is used in making rayon and high grade soap. Another use is for tank-cars carrying phenol (carbolic acid) to be used in making "catalin" and other synthetic resins. Large-scale equipment of this kind is made of "nickel-clad" steel, formed by placing a slab of nickel on a heavier slab of steel, and rolling the composite piece.

Inconel, containing 13% chromium, 6.75% iron and the balance nickel, is both corrosion and heat resistant. Because of its workability and weldability, it has been found suitable for electrical heating unit tubes and exhaust manifolds for aero-engines. A well-known use is in dairy equipment.

25-12 and 35-15 for Severe Duty

Much has been said and written in recent years about stainless steel, particularly the type containing 18% chromium and 8% nickel. For more severe duty, particularly heat resistance, these percentages rise to 25-12, and even to 35-15.

A successful composition of cast iron for corrosion resistance has been standardized under the name of Niresist; it contains 14% nickel and 6% copper.

Four per cent of all nickel produced goes into "nickel silver," a copper-zinc alloy containing 8 to 30% (usually 18 to 24%) nickel. Nickel silver is strong, corrosion resistant and white in color, and is used as a base for plated ware, for drawing instruments, etc.

The "cupro-nickels" (70% copper, 30% nickel, and 80-20) are used for marine engine condenser tubes. These alloys are more corrosion resistant than copper or bronze, yet they contain sufficient copper to discourage barnacle growth.

The latter part of Mr. Searle's address was a valuable scientific discussion of corrosion in general. He pointed out that the rate of corrosion of any metal depends on (1) the composition of the corrosive medium; (2) the temperature; (3) the velocity.

Corrosion Rate Depends on Electrolyte

(1) Not only the kind of electrolyte is important, but its concentration and degree of aeration are often vital. For instance, in cold 3% sulphuric acid, free from oxygen, stainless steel dissolves over 20 times faster than monel, but in the same acid saturated with oxygen monel dissolves over 20 times faster than stainless.

(2) Generally, as temperature rises the rate of corrosion increases, to a maximum between 150 and 170° F.

(3) The rate of corrosion rises as the velocity of the corrosive medium rises.

It is well known that it is inherently difficult to devise an accelerated test that is really comparable with actual service. Field tests are generally more reliable. Mr. Searle described the spool type specimen holder which has been found very satisfactory in researches extending over ten years.

Active discussion continued to a late hour, and a hearty vote of thanks was proposed by Dr. Stansfield.

57 Join at A.S.M. Booth

Fifty-seven new A.S.M. membership applications were filed at the A.S.M. booth during the National Metal Exposition Oct. 19 to 23.

Credit for this good work should go to Allen M. Thurston, chairman of the Cleveland Chapter Convention Committee, who saw to it that the booth was well manned with members of the Chapter all during the show.

A large but unrecorded number of applications taken at the National Office of the Society were also garnered as a direct result of the National Metal Congress.

Two Courses are Arranged

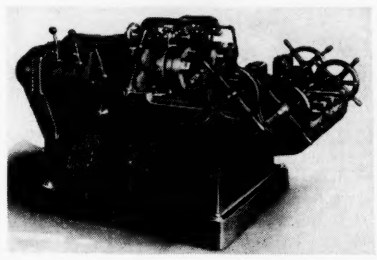
New York Has Fall Course on Ferrous Metals; Non-Ferrous in Spring

Two educational courses on ferrous and non-ferrous metallurgy respectively have been arranged by the New York Chapter. The ferrous metallurgy course started Nov. 2, and the non-ferrous course will be held next spring.

The sessions are held in the Hall of Metal Products Exhibits, International Bldg., Rockefeller Center. Free to members, the course requires a $5.00 registration fee for non-members which can be credited toward a membership in the Society.

The list of lecturers for the ferrous course includes such well-known names as E. S. Davenport, J. R. Vilella, Samuel Epstein, Sam Tour, J. J. B. Rutherford, and A. B. Kinzel. In addition to the fundamental aspects of ferrous metallurgy, one lecture will be devoted to the metallography of stainless steel and a second to welding.

Modern Design and Novel Features Found in Acme's New Threading Machine



The introduction of the new Model 35 Acme double threading machine by the Acme Machinery Co., Cleveland, brings to industry a sturdily built, high production machine of modern, streamline design.

All control levers are within easy reach of the operator from his regular working position. Speed changes are accomplished through a self-contained selective type gear box. Changes are made available by means of levers at the front of the machine. An index plate is provided to indicate proper position for each lever to obtain desired speed.

The Acme tangent die head is extremely simple and consists of two parts—the die ring and barrel. The die block, a hardened steel forging, accurately ground, operates in long, hardened tool steel bushings in die ring and between hardened and ground plates in die barrel. This construction provides long life and assures accurate die alignment.

The carriage is of sturdy construction with extra long supporting surfaces gibbed to provide take-up for wear. The machine is motor driven with single pulley multiple "V" belt drive.

The bed is of distinctly new streamline design and novel construction with heat treated carbon steel ways, thus insuring long life.

Principles of Wire Drawing Uses and Properties Given

By Donald Flinchbaugh

York Chapter—L. D. Granger, metallurgist and assistant to the vice-president of the Wickwire-Spencer Steel Co., was the guest speaker at the meeting on Sept. 9.

Mr. Granger gave the York group an excellent conception of the subject of wire, which included a description of some of the basic principles of wire drawing and some remarks on the methods of correlating uses and properties of wire.

Mr. Granger's lecture was accompanied by a fine display of photographs of the various operations in the wire industry. The evening was concluded with a general and lengthy discussion.

Invisible Rays Are Popular Subject at Chapter Gathering

Doan Shows Relation Between Divisions of Spectrum

By Ralph W. E. Leiter

Philadelphia Chapter—A large group of members and guests assembled at The Engineers Club for the second meeting of the season on Oct. 30. Dr. Gilbert E. Doan, assistant professor of metallurgy, Lehigh University, addressed the Chapter on the subject of "Invisible Rays in Modern Engineering."

Dr. Doan very carefully explained the electromagnetic spectrum and thus showed the very close relationhip between X-rays, visible light and the other major divisions of the spectrum. The methods of production and the various uses of these rays were extremely interesting and fascinating.

Dr. Doan talked at some length on the metallurgical applications of X-rays and gamma rays.

The many questions and the lengthy discussion which followed showed how clearly the subject was presented and how well it was received. Questions were asked on the sensitivity and limitations of gamma and X-rays in radiography. The possibility of third dimensional radiographs and detection of internal strains was also discussed.

Chairman Tom Nelson called on Norman Mochel to close the meeting. He spoke of the tremendous strides made in harnessing the invisible rays in less than a generation and suggested untold applications in the future.

The dinner preceding the lecture was very popular. Those who attended were treated to an illustrated talk by Cameron King on the construction, launching and operation of the Queen Mary.

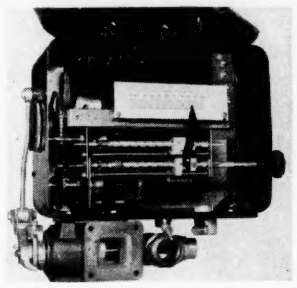
200 Chicago Members Hear Jominy on "Metallic Wear"

By David R. Howerton

Chicago Chapter—Over 200 members were present for dinner at the regular meeting on Oct. 8. Pat Flanagan, popular sports announcer from radio station WBBM gave a short review of the sports world, discussing such topics as the World's Series, the coming football season, and team "dope."

The guest speaker of the evening, W. E. Jominy, Research Laboratories, General Motors Corp., was introduced to the audience of over 300 members, by Technical Chairman H. S. Van Vleet. In his lecture on "Metallic Wear," Mr. Jominy presented the methods by which wear is being studied and factors affecting it.

Throttling Control Made by Lindberg Has New Principle



The Lindberg Engineering Co. announces an important development in temperature control equipment which is now offered to industry as the Lindberg Throttling Control.

This fully automatic unit operates on a new principle, assuring positive accuracy and uniformity in furnace heating rates.

The unit consists of a standard proportioning valve driven by a reversible motor. The low limit switch is fixed while the upper or "O" switch is automatically adjusted by means of a small reversing motor operated by the contacts on the control instrument.

For example, if the temperature tends to move out of the neutral zone on the high side, the contact instantly closes, shutting off the heat entirely and, at the same time, lowering the position of the adjustable limit switch. A large excess of heat will cause a large adjustment in the valve and vice versa.

When the temperature returns to the neutral zone, the contact opens; the limit switch ceases adjustment and the valve opens to the newly set position.

Should the temperature drop, the limit switch immediately moves to a more open position, the amount of the adjustment being in proportion to the time required for recovery.

Thus the control is never satisfied unless the temperature is exactly correct. Overshooting is practically eliminated, since the valve shuts off completely whenever there is the merest tendency for the temperature to exceed the control instrument setting.

Advanced Seminars Planned For Theoretical Discussion

Microscopic Technique Is Subject of First Discussion at Chicago

Advanced Educational Seminars are planned again this year by the Chicago Chapter, the first one on "Microscopic Technique" being held on Nov. 17.

The purpose of these seminars is for informal discussions of highly theoretical subjects; they are primarily designed for those with advanced training and experience. These men represent about 20% of the Chapter membership.

The discussion of microscopic technique will be led by Dr. M. A. Grossmann of Carnegie-Illinois Steel Corp. Such recognized authorities as W. Zieler of E. Leitz, Inc., A. Buehler of A. I. Buehler, and J. H. Mead of Bausch & Lomb Optical Co. will be prepared to give a few remarks on various aspects of the subject.

Presidents En Masse!

All living past-presidents of the American Society for Metals were present at the National Metal Congress and Exposition.

The following 13 men made up the list:

A. E. White, 1921; F. P. Gilligan, 1922; W. S. Bidle, 1925; R. M. Bird, 1926; J. F. Harper, 1927; F. G. Hughes, 1928; Zay Jeffries, 1929; R. G. Guthrie, 1930; J. M. Watson, 1931; A. H. d'Arcambal, 1932; W. B. Coleman, 1933; W. H. Phillips, 1934; and B. F. Shepherd, 1935.

Tri-City's Practical Course On Metals Has 14 Lectures

Fourteen lectures comprise the "Practical Course on Metals" being presented by the Tri-City Chapter of the A.S.M. The course started Oct. 6 and will end Feb. 23, 1937.

An introductory lecture on "Metals and Their Properties" was presented by John Fielding of State University of Iowa, and on Oct. 20 a metallographic laboratory demonstration was given by representatives of Rock Island Arsenal, Farmall, and Deere & Co.

Five lectures were then devoted to Dr. Grossmann's course on heat treating, which will be completed on Dec. 1.

Other subjects to be considered during the season are heat treating equipment, physical testing methods, chemical testing methods, heat treating methods, foundry metallurgy, and foundry methods.

Smith Alloy No. 10, New Resistor Alloy, Described by Hoyt

Also Talks on Oxygen Content And Polarized Light

By Walter C. Troy

Notre Dame Group—Two subjects were covered in the talk by Dr. S. L. Hoyt, metallurgist, A. O. Smith Corp., in addressing the first meeting of the season on Oct. 15 in the Engineering Building at Notre Dame.

Dr. Hoyt first discussed Smith Alloy No. 10. He briefly reviewed the field of electric furnace resistor alloys and gave a detailed account of the Fe-Cr-Al system, which contains this alloy.

An important lesson taught in this respect is that ternary alloys should be considered for investigation purposes as ternary alloys and not as pseudo-binary alloys. A certain German investigator, using the latter method, by holding one component constant and varying the others, obtained a supposedly maximum life for any alloy of the system, while Smith Alloy No. 10 is much longer lived at the same temperature and was developed by varying all three components in a truly ternary fashion.

In the second part of his talk, Dr. Hoyt showed the importance of having oxygen content expressed in a form that can be correlated with metallurgical properties—that is, expressed as fractional oxygen. It was shown that the total oxygen did not adequately indicate the superiority of a cellulose rod weld over a bare rod weld, although the latter contained almost all of the oxygen in the form of iron oxide and the former, on the other hand, held it in the form of relatively harmless silicates.

The talk was concluded with some remarks on the interesting possibilities in the examination of polished surfaces with polarized light.

Heat Treating Course Presented

L. E. Raymond, metallurgist, Singer Mfg. Co., will present the first series of New Haven's educational lectures.

This course is on the "Principles of Heat Treatment" and will be based on Dr. Grossmann's outline. It is divided into three lectures on Nov. 23, 30 and Dec. 7, at Hammond Laboratory, Yale University.

The second series, to be given in March and April, 1937, will consist of two non-ferrous lectures to be presented by Dr. R. M. Brick of Yale University.

Employment Service Bureau

Address answers care of A. S. M., 7016 Euclid Ave., Cleveland, unless otherwise stated

Positions Wanted

SALES ENGINEER: B.S. of E.E., ten years experience engineering and sales having specialized in development of electrical, heat treating, and metallurgical equipment. Intimately knows Cleveland territory. Fine personality and splendid references. Box 11-5.

RADIOGRAPHER: Age 27; three years experience pressure vessel welded seams and sundry. Also experience in metallurgical laboratory and shop photography. Now working. To take charge of new radiographic department with progressive organization. References. Box 11-10.

TECHNICAL GRADUATE: Eight years experience in arc welding research, development, design and commercial welding applications. Box 11-15.

METALLURGIST: Employed, with unusual background including development and sales promotion experience, desires technical or administrative connection in these or related fields with aggressive producer or consumer. Box 11-20.

MASTER OF SCIENCE in Metallurgy, Michigan College of Mining and Technology, also has mechanical engineering degree from Budapest University of Engineering. Extensive scientific and practical training. Speaks and writes fluently English, French, German. Box 11-25.

METALLURGIST: Capable of taking charge of all experimental, development and research work; has supervised purchase, installation and design of laboratory apparatus, developed laboratory technique and procedure. Now employed, desires to broaden scope of activities in both ferrous and non-ferrous metals. Graduate of Rensselaer Polytechnic Institute. Box 11-30.

WIRE MILL SUPERINTENDENT: 18 years experience in cold drawing of needle wire, carbon tool steels, alloy tool steels, alloys, non-corrosive irons and steels, and heat resisting steels. Desires a position in production, service, or sales. Box 11-35.

METALLURGICAL ENGINEER: 26 years old; B.S. 1931 and M.E. 1936, Case School of Applied Science. Employed as chief metallurgist of large tool company for past five years; experience with nitriding, high speed hardening, tool steels, carburizing and welding. Desires position with alloy tool steel mill as contact metallurgist with opportunity for sales. Detroit territory preferred. Box 11-40.

Position Open

METALLURGICAL ENGINEER: Inspector or engineer with metallurgical experience or training, under 35 years of age, for inspection at manufacturer's plants. Pressure tanks and miscellaneous equipment for refinery and oil field service. Box 11-50.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of THE REVIEW, published bi-monthly, at Cleveland, Ohio, for October 1, 1936. State of Ohio, County of Cuyahoga, ss. Before me, a Notary Public, in and for the State and county aforesaid, personally appeared Ray T. Bayless, who, having been duly sworn according to law, deposes and says that he is the Editor of THE REVIEW of the American Society for Metals, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations to wit:

1.—That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Society for Metals, 7016 Euclid Ave., Cleveland, O.; Editor, Ray T. Bayless, 7016 Euclid Ave., Cleveland, O.; Managing Editor, M. R. Hyslop, 7016 Euclid Ave., Cleveland, O.; Business Manager, W. H. Eisenman, 7016 Euclid Ave., Cleveland, O.

2.—That the owner is: The American Society for Metals, 7016 Euclid Ave., Cleveland, O., which is an educational institution, the officers being: President, R. S. Archer; Vice-President, E. C. Bain; Treasurer, W. P. Woodside; Secretary, W. H. Eisenman; Trustees: B. F. Shepherd, Walter Mathesius, G. B. Waterhouse, R. L. Kenyon, S. C. Spalding. All officers as above, 7016 Euclid Ave., Cleveland, Ohio.

3.—That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4.—That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Ray T. Bayless, Editor.

Sworn to and subscribed before me this 1st day of October, 1936.

(Seal) Arthur T. Wehrle, Notary Public. (My commission expires Jan. 21, 1938.)